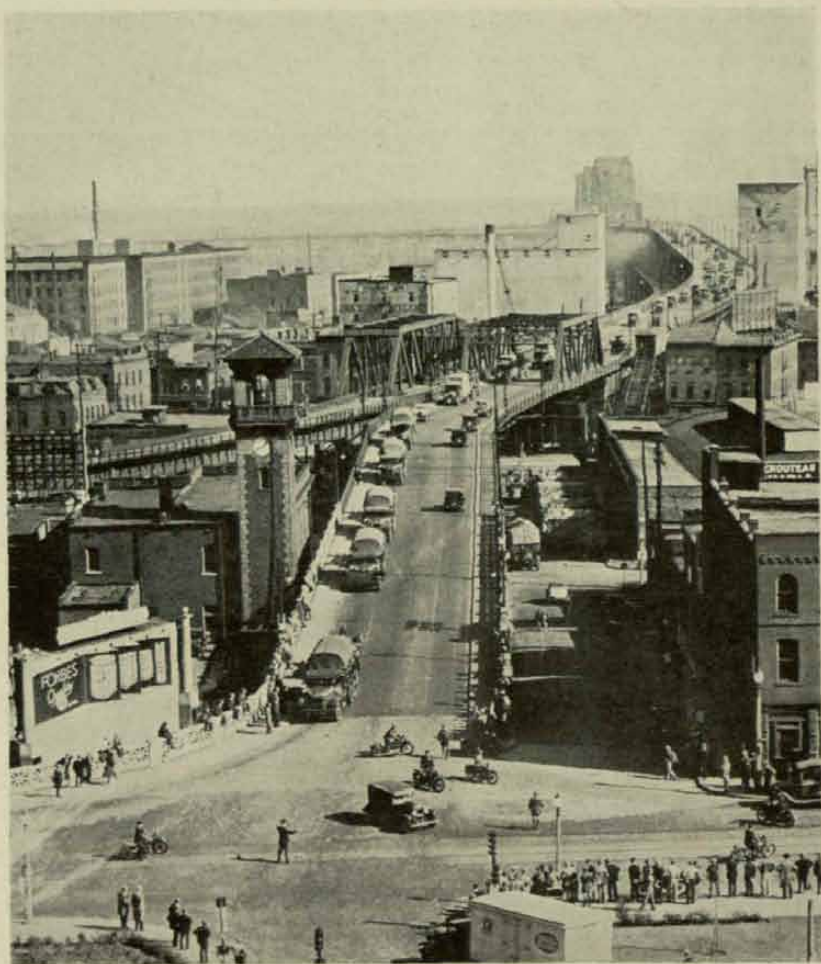


COAST ARTILLERY JOURNAL



61st Coast Artillery (AA) Entering St. Louis, Mo.

November-December, 1932

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE DEC 1932		2. REPORT TYPE		3. DATES COVERED 00-11-1932 to 00-12-1932	
4. TITLE AND SUBTITLE The Coast Artillery Journal. Volume 75, Number 6, November-December 1932				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Coast Artillery Training Center,Coast Artillery Journal,Fort Monroe,VA,23651				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 82	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

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THE COAST ARTILLERY JOURNAL

Member Affiliated Military Magazines

Published as the U. S. Artillery from 1892 to 1922

MAJOR STEWART S. GIFFIN, C.A.C., Editor

Volume 75

November-December, 1932

Number 6

Publication Date: December 1, 1932.

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The COAST ARTILLERY JOURNAL pays for original articles upon publication.

Published bi-monthly under the supervision of the United States Coast Artillery Association for the information of the Coast Artillery personnel of the Regular Army, National Guard and Organized Reserve.

Publication Offices, Telegraph Press Building, Cameron and Kelker Sts., Harrisburg, Pa.; Editorial Offices, 1115 17th Street, N. W., Washington, D. C.

Terms: \$4.00 per year. (Coast Artillery Association members, \$3.00 per year). Single copies, 75 cents.

Entered as second class matter at Harrisburg, Pa., Feb. 12, 1931, under the Act of March 3, 1879, for mailing at special rate of postage provided for in Section 412, Act of October 3, 1917.

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Notes of the Coast Artillery Association

Coast Artillery Association Trophy Won by 243d Coast Artillery

THE National Guard trophy of the Coast Artillery Association has been awarded to the 243rd Coast Artillery (Harbor Defense), Rhode Island National Guard, for the training year 1931-1932. This splendid regiment is commanded by Colonel J. J. Collins, with headquarters in Providence, Rhode Island.

The winning organization attained a total score of 90.23 in the contest which includes the following factors:

	<i>Maximum weight</i>
Results attained at target practice with the principal weapon	70
Per cent of units rated satisfactory at the Annual armory inspection	10
Attendance at drill during the 12 months prior to the annual armory inspection	5
Per cent of personnel qualified as gunners	5
Per cent of units rated satisfactory at field inspection	10

The data for these elements is obtained from the official reports of target practice, annual armory inspection, and the annual field inspection, all of which are examined in the office of the Chief of the Militia Bureau, and the winning organization determined upon.

Other organizations given honorable mention in the report of the Chief of the Militia Bureau to the Chief of Coast Artillery were—

The 251st Coast Artillery (AA), California National Guard, Colonel Harry H. Morehead, San Diego, California. Score, 86.01.

The 202nd Coast Artillery (AA), Illinois National Guard, Colonel Charles C. Dawes, Chicago, Illinois. Score, 85.05.

The 206th Coast Artillery (AA), Arkansas National Guard, Colonel Elgan C. Robertson, Mareanna, Arkansas. Score, 84.07.

The 249th Coast Artillery (HD) Oregon National Guard, Colonel Clifton M. Irwin, Portland, Oregon. Score, 83.56.

Major Arthur E. Rowland and Captain Marvil G. Armstrong are the regular officers on duty with this regiment as instructors.

Colonel Collins and the members of his regiment are to be congratulated on this outstanding performance.

The trophy will be presented at an appropriate ceremony shortly after the first of the year.

THE UNITED STATES COAST ARTILLERY ASSOCIATION



“The purpose of the Association shall be to promote the efficiency of the Coast Artillery Corps by maintaining its standards and traditions, by disseminating professional knowledge, by inspiring greater effort towards the improvement of materiel and methods of training, and by fostering mutual understanding, respect and cooperation among all arms, branches and components of the Regular Army, National Guard, Organized Reserve and Reserve Officers’ Training Corps.”



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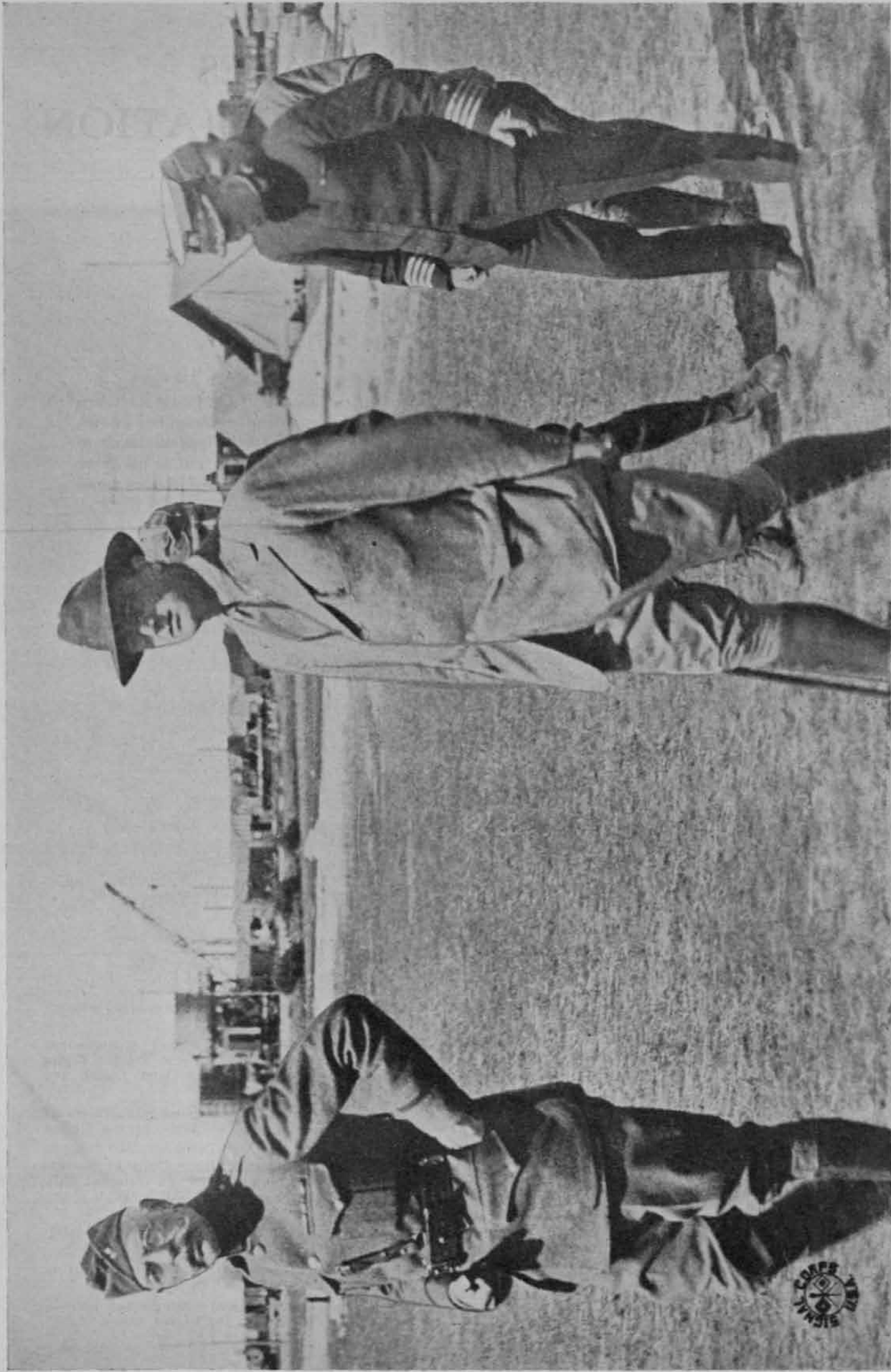
- a. Commissioned officers, active or retired, of the Coast Artillery of the Army of the United States.
- b. Commissioned officers, active or retired, of the Staff Corps and Departments of the Army of the United States who at any time have served in the Coast Artillery.
- c. Commissioned officers, active and retired, of the Philippine Scouts who have served in the Coast Artillery.
- d. Former commissioned officers of Coast Artillery of honorable records in the Army of the United States.
- e. General officers, active or retired, of the Army of the United States.

“The following shall be eligible for Associate membership:

- a. Commissioned officers and former commissioned officers in good standing of the United States Army, Navy, Marine Corps, Coast Guard and Public Health Service.
- b. Warrant officers and non-commissioned officers of the Coast Artillery of the Army of the United States.
- c. Members of the Coast Artillery Units of the Reserve Officers’ Training Corps and Citizens’ Military Training Camps.

“The following shall be eligible for Honorary membership:

- a. Civilians who have demonstrated their interest in national military preparedness.
- b. Persons who have rendered distinguished services to the Association or to the United States.”



President-elect Franklin D. Roosevelt, then Assistant Secretary of the U. S. Navy, and Rear Admiral C. P. Plunkett, on an Inspection Tour in France in 1918. (Admiral Plunkett is Wearing the Uniform of a Major General in View of the Fact He is on Land Duty with the Coast Artillery)

Long Range Firings in Hawaii

By Captain LeR. Lutes, C.A.C.

The Problem

FIRING seacoast artillery at moving targets at long ranges has been a problem of interest to officers of our corps for many years. It has been generally conceded that a target beyond the horizon or the limit of vision of terrestrial observers must be located by one of three general methods, i. e., with the use of aerial observers, with the co-operation of naval submarines or by sound ranging. Of these three general methods, the one using aerial observation would appear the most practical under all war conditions.

Tests of "aerial position finding" methods had been conducted prior to 1931, but few ideas had been advanced with view to solving the problem when the following limitations existed:

(1) due to atmospheric conditions or smoke screens the aerial observer's plane is not visible from shore;

(2) for the same reasons the aerial observer cannot re-locate his position by observing land marks.

(3) enemy antiaircraft activity prevents the aerial observer from closing within antiaircraft gun range of the target.

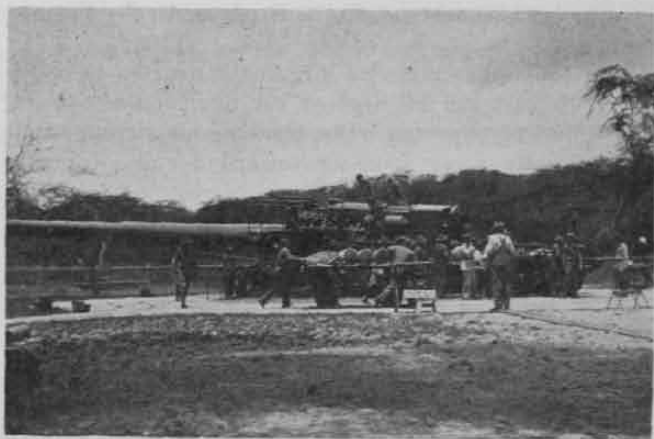
With view to solving these problems and obtaining other special information, the War Department directed that long range experimental firings be held in the Hawaiian Department during the fiscal year 1931. The War Department Directive for these tests, prescribed among other requirements, that attempt be made to locate the observation plane by using radio-direction finders (Marine type) and that the aerial observer re-locate the target by aerial, vertical base methods. It was further prescribed that the initial location and tracking of the target, for actual firing courses be based upon data from aerial observation only; that it be assumed that the target represented a hostile warship equipped with modern antiaircraft weapons; that the observing plane should not be flown within 10,000 yards of the target and that the plane must be invisible from shore.

The Department Commander charged the Department Air Officer with the development of an instrument to be used by the aerial observer in re-locating the target by aerial, vertical base methods. The Commanding General of the Separate Coast Artillery Brigade (Brig. Gen. Wm. E. Cole) was charged with the general supervision and conduct of the position finding tests and firings. General Cole allotted the practical development and solution of the problem to the Commanding Officer, Harbor Defenses of Pearl Harbor, (Col. Homer B. Grant, C. A. C.)

Preliminary Tests

Although the target was to be tracked by the firing battery using the aerial position finding system only, it became apparent that terrestrial observers must be able to see and track the target in order to safeguard the towing tug and in order to furnish sufficient data to form a basis for comparative analysis with the aerial-radio compass system. Consequently, the Ordnance Department was charged with the construction of a target of sufficient size to be visible from shore at 45,000 yards range and the Battery Commander of the 16 inch gun battery was directed to conduct a series of visibility tests, using the observation stations of his battery. The 16 inch gun battery is equipped with the latest long range depression-position finding instruments. The visibility tests indicated that the accuracy of the vertical, base position finding methods of the battery compared very favorably with that of the horizontal base methods.

While the visibility tests were being conducted, the radio-compass stations were built at certain intervals on the south coast of Oahu and the three radio direction finders installed. These instruments are radio receivers with loop antennae. To use them the airplane transmits radio signals at predetermined intervals. The loop at each station is turned to that azimuth from which the strongest reception is obtained and is then oscillated until the "null" point of sound is obtained during the location-dash-signal. The three azimuths thus obtained are then telephoned to a plotting board where the ground position of each radio compass station has been re-located. The azimuths are then transformed into three rays on the plotting board which form a triangle of error at their intersection. The airplane is considered to be at the approximate mean of the triangle of error. Before proceeding with these



Powder Coming Up!

instruments it was necessary to calibrate them. To do this, experienced, terrestrial observers were placed at each radio compass station to track an airplane using azimuth instruments. At the same time the plane was tracked by the radio compass method as indicated above. Data obtained from both methods were used in constructing two plots in a plotting station at the 16 inch gun battery, which station was locally known as the "Compass Plotting Station." The two plots were

fairly accurate correction made for it. Attempt will be made to further overcome this difficulty in future tests, by use of a different antennae on the plane.

After trying several depression angle observation instruments in preliminary tests, the Air Corps personnel assigned for our practices decided to use an "Aperiodic Compass" for obtaining the azimuth of the target from the plane and an "Octant" to read the depression angle for obtaining ranges.

Training Plans and Organization

With the preliminary technical tests well underway, a program of co-ordinated training could be considered. The War Department Directive contained a suggested program of firings which included—

- 5 target practices with 155 mm guns.
- 2 target practices with 12 inch guns.
- 2 target practices with 16 inch guns.

Ammunition allowances were provided for these firings and the program was adopted, the 155 mm gun firings and the 12 inch gun firings to be considered as preliminary, ex-caliber practices for and leading up to the 16 inch gun firings.

It now became obvious that the various tests and numerous statistics required by the War Department technical directive would involve the services of nearly all artillery officers of the Harbor Defenses of Pearl Harbor. An organization was then formed to subdivide the various duties.

The group commander, Major Frederick A. Price, 15th C. A., was charged with the direct supervision of the tests. He, personally, directed the preparation of the radio direction finders and the development of their operators. He also conferred with the Air Corps representatives in the development of instruments for re-locating the target from the plane.

A Safety Section was formed under Major Berthold Vogel, 15th C. A., for the purpose of operating a regular horizontal base track as a safety check against the track of the aerial position finding system. After firing, this horizontal base track was to become the basis of comparison of results for analysis and statistical purposes.

An air-ground liaison section was formed under the supervision of Major Austin G. Frick, 55th C. A. This section reported on certain special tests of radio and panel communication.

A Statistical Section was organized under the supervision of Major Ira B. Hill, 41st C. A., for the purpose of gathering and co-ordinating the many special reports submitted by various sub-sections in compliance with the technical directive.

The Battery Commander of the 16 inch gun battery was charged with the co-ordination of all firing batteries, installation of two additional plotting rooms and communications at the battery, including radio, the training of a range section to be used for all firings, preparation of the 16 inch battery and its installations for firing and finally for the conduct and adjustment of the fire.

Battery A, 15th Coast Artillery, was assigned to



Preliminary Inspection

compared for the purposes of calibrating the radio direction finders. Master Sergeant J. A. Dula, 15th C. A., increased the accuracy of the direction finders by mechanically attaching a movable coil antennae to the loop to be used instead of the fixed, vertical sense antennae.

Contradictory errors as large as 7 degrees were reduced to less than 1.5 degrees. A precision of one degree could be expected when tracking an airplane that flew directly away from or toward a radio compass station.

The antennae used by the plane consisted of a trailing, single strand wire, 150 feet long held down by two heavy lead balls. This antennae reeled or "slanted" away from the plane as it was "dragged" around, the direction of its slant depending on the direction of flight of the plane. This caused an approximately constant difference between the plotted position of the plane and its true position, which difference was termed "lag." After a series of tests it was found that a mean of this error could be determined and a

Battery Williston, 16 inch (B. C.), Fort Weaver, T. H., and took over the battery from the Ordnance Department. This big gun battery, which is equipped with all the modern electrical installations for traversing, loading, elevating and firing, had been in the hands of Ordnance caretaking detachments since the date of its emplacement in 1924. The guns had been proof fired in 1924 for the purpose of testing carriages only. Five rounds had been fired from one gun and four from the other but as the splashes had not been observed, no reliable firing data on the battery was available.

As but one airplane was allotted for the tests and firings, it was obvious that the aerial observer could not furnish a continuous track of the target and at the same time observe and report the results of fire. The general problem was then divided into two phases. The first phase included the location of the aerial observer by use of radio direction finders; the INITIAL location and direction of movement of the target with reference to the aerial observer (as determined by four or five observations) and the re-location of the target with reference to the firing battery. It was decided that this phase should be developed in a separate plotting room, established in a tent in rear of the battery and named the "Compass Plotting Station." Captain James H. Smith, 15th C. A., prepared the plotting board for locating the airplane and a protractor for re-locating the target. He also acted as plotter in this station.

The second phase of the problem was to re-locate the target on the firing battery plotting board, plot the approximate initial course of the target based on the first four or five aerial observations and to then open fire and adjust the subsequent track or course of the target upon the reported "spots" or results of fire.

These two phases were handled on separate plotting boards in an attempt to obtain more complete data and insure better accuracy with data from the radio direction finders. If the aerial-radio-compass system is adopted as an auxiliary position finding system for 16 inch batteries, a separate compass plotting station will not be necessary as the plot of the airplane's position can be superimposed on the battery plotting board.

Operation of the Range Section

In all target practices and position finding tests the position of the aerial observer was plotted as previously described and the range to the target from the airplane computed from the depression angle reported by the aerial observer. This azimuth of the target from the airplane was obtained by the observer using the Aperiodic Compass, but this reading had to be corrected for local declination at the Compass Plotting Station.

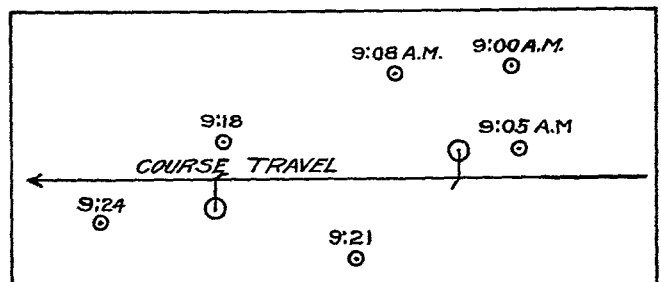
The second phase of "position finding" began in the plotting room of the firing battery. Here the Plotter, (Lieut. Wm. M. Vestal) wore a headset connected directly to the Plotter in the Compass Plotting Station. He received the azimuth and ranges of the first four or six positions of the target as re-located from

the directing point of the battery and plotted them on the battery plotting board using the gun arm only. Each of these plotted target positions was marked with the actual time location of the target, i. e., 10:00 A.M., etc. Time "one" was announced in the battery plotting room at any convenient time after data was received from the Compass Plotting Station.

The next important step was to determine the target's course after receiving and plotting five or more initial positions of the target. The plotter checked by the Range Officer, (1st Lieut. Wm. I. Brady), drew a line representing the mean of the plotted points, which line was assumed to be the approximate course of the target. If possible an approximate course of the target (in azimuth) was obtained from the aerial observer and used as a check against the course assumed by the Plotter. If such a course was received from the aerial observer it was given two-thirds weight in determining the initial course for use in computing travel and opening fire. When the initial approximate course was plotted in the battery Plotting Room the Compass Plotting Station ceased to function except for statistical purposes and the aerial observer proceeded to a position from which he could "spot" the fall of the shots and report them direct to the firing battery thru the radio of the firing battery.

The course of the target having been determined the plotter next computed the speed or travel of the target using as a basis the time of the first and last plotted points, (disregarding points that were obviously wild). This travel was converted into yards per second and the position of the target computed for some future time interval bell. (Time interval was one minute.)

In case the initial positions of the target reported by the aerial observer and re-located by the Compass Plotting Station were unusually erratic, the plotter would attempt to group these positions into two groups. He would then plot the position of the mean of each group and draw the assumed course as a "mean" course between the two "mean" plotted points of the groups (giving the aerial observer's course two-thirds weight). He would next compute travel along this assumed course between points projected from the "mean" positions mentioned above. Example:



A setforward point having been determined it was corrected ballistically. Firing data based on this point were sent to the guns. The Safety Officer at the gun emplacement telephoned the range and azimuth set on the gun to the Safety Section Plotting Room which was in a tent near the plotting room of the 16 inch bat-

tery. Here the data were checked against that obtained by the Safety Section (using normal Coast Artillery methods) and if safe to fire, the guns and plotting room of the firing battery were notified accordingly. If the prediction was dangerous, fire was suspended at the guns and the Plotting Room notified. On receipt of a report "prediction dangerous" the plotter moved his setforward point back in azimuth the length of the towline and predicted again. This process was repeated until a prediction was pronounced "safe." This might appear to have introduced a factor of assistance to the firing battery in obtaining an approximate azimuth of the target when initial positions were too near the towing vessel. However, this could not be avoided and had the firing been under service conditions the same information would have been obtained from the "spot" of shots.

In the ex-caliber preliminary firings with 155 mm guns, the ranges and azimuths were converted into miles in the plotting room of the 16 inch battery, as the scales on the 155 mm guns are in miles. This conversion was made automatically using a follow-the-pointer method on combination "degree-mil" and "yard-mil" scales.

During the period of time required to obtain initial data for a course the Battery Commander was stationed in the Plotting Room where he could be in touch with the Range Section, Safety Section, guns and

aerial observer. His station should be in a room adjoining the Plotting Room but as no room was available and the Plotting Room was large, one side of the room was used as a B. C. Station with telephone operators to guns, Safety Section and Battery Radio Station. The work became so well organized and settled after all the preliminary firings that for the 16 inch gun firing the Battery Commander remained at the guns. The Range Officer's duties were to co-ordinate all operations in the Plotting Room particularly to keep all personnel on the proper time interval. In addition, he had the very important duty of watching the plotter's course and verifying any changes that appeared necessary. Lieut. Brady proved to be an exceptionally good range officer. His range section made no errors in operation during any of the firings.

Method of Adjustment of Fire

Pursuant to the directive, adjustment of fire was based solely upon results of aerial spotting. *It was assumed that the projectile attained the range expected and that deviations were due to errors in determining ranges to the target.* Consequently the course was moved "in" or "out" in range on the plotting board and its direction changed as indicated necessary from spotting reports, received from the aerial observer.

It was considered that the movement of the target introduced the necessity for constantly changing the laying of the piece. The range finding feature of the fire control system was discarded after the first shot. After that the Plotter was merely interested in determining the movement of the target, which was of more importance than its initial location. The speed of the target was only six to eight miles per hour. If the target had approached over zig-zag courses at high speed, adjustment by moving the course would have been much more difficult. Such a target was not available. Under battle service conditions, the aerial observer should be trained to observe and report any change in course of target. He did not do this in the preliminary practices stating that he could not discern the changes in the course.

Practical Operation of Adjustment of Fire

The aerial observer used the clock system for spotting. The target tug towline was considered the 12 o'clock line, target being at center of clock. In the Plotting Room of the firing battery, the plotter used a celluloid protractor, with the 12 o'clock-6 o'clock line being in reverse order from that of the aerial observer. The center of the protractor was placed on the point, the data for which was sent to the guns, the 6 o'clock-12 o'clock line pointing along the course of the target. The protractor was perforated in such a manner that the plotter could instantly mark the correction for the splash with a pencil (thru the protractor) on receipt of the spot. Thus a 3 o'clock spot from the observer, immediately became a 9 o'clock adjustment.

To make the adjustment in range, the plotter used a parallel ruler drawing a new course parallel to the



Shot on the Way

old course unless the falling of shots in the same sense by uniformly slipping away from the assumed course, indicated that the new assumed course should deviate from the old one. In the latter case he plotted the new course at such angular deviation from the old one as appeared indicated by the "spots." Normally full range corrections were made until the splashes crossed or bracketed the course. The rule of successive approximations was then followed. Wild shots of four probable errors or greater were disregarded.

A constant deflection ahead or behind the target indicated that a correction of travel should be made. Splashes consistently in the same sense for range, regardless of corrections, indicated a changing course and called for full or radical range corrections until the course was bracketed.

It is obvious that the difference between the range fired upon and the range obtained by replotting the horizontal base track of the Safety Section, contained a combination of errors, namely: errors in plotting initial position of target due to airplane-radio-direction-finder system errors; errors due to erroneous aerial spotting; and dispersion of shots. However, if spotting were exact, a series of points, indicating the plotter's total adjustment, would form a "ballistic" course of the target regardless of the accuracy of the initial data received from the Compass Plotting Station.

A firing interval of two minutes, for 155 mm guns, was required to receive and plot the spot, make necessary corrections in the plotting room, send data to the guns, have it checked by the Safety Officer against the horizontal base track of the Safety Section and reported "safe" or "dangerous" as each case developed. For similar reasons a firing interval of three or more minutes was necessary for the 16 inch guns. In these firings the Safety Officers at the guns had to check azimuth and elevation settings and receive an "OK" from the Safety Section. In addition an officer was required to check the elevation of the gun before and after each shot with calibrated quadrant.

Rules of Adjustment

Before reading the report of one of the practices, the following rules of adjustment should be considered:

As a result of all the long range firings held in the Hawaiian Department, certain rules were deduced and other old ones confirmed.

The following observations and rules developed in the Panama long range firings were found applicable to our firing in Hawaii and were confirmed:

The center of impact of a salvo is apt to be "spotted" too near to that of the shot closest to the target.

Spotting errors will affect the adjustment both in range and direction. But results can be secured only by considering the behavior of the plotter's course in range and azimuth simultaneously.

The reliability of the ballistic course is greatest when the deviations are small, the spotting, then being more reliable.

Rule 1. A change of direction of course is not justified as long as deviations are becoming smaller.

Rule 2. When the target has been crossed by the fall of the shots and a change of *direction* of course is not required, continue the adjustment by successive approximations.

Rule 3. A change in *direction* of course is indicated but *not* necessarily fully justified when:

Deviations are sensibly constant or increasing in magnitude.

A reliable ballistic course has been established.

Rule 4. When a change in direction of the course seems likely but *not* fully justified, make a full correction for each deviation until the target has been crossed or until the ballistic course is well established.

Rule 5. A shot some distance from the target should be excluded from the ballistic course and not used in successive approximations.

Rule 6. When three successive shots fall in the same sense, look for the reason.

In addition to the Panama rules, the following rules were developed, based on observations of our firings in Hawaii.

Rule 1. Initial adjustments in travel should be bold until the target is bracketed in "travel." Travel can be then reduced or increased in increments of ten per cent of the initial assumed travel until a bracket is obtained. Do not use the first spot in determination of travel, (not sufficiently reliable).

Rule 2. Full corrections in range should be made until the "spots" or splashes cross the plotter's assumed course of the target. Successive approximations should then be undertaken. In determining the initial course of the target, the first spot, if over 500 yards, should be disregarded.

Rule 3. If after four or more rounds it becomes apparent that the assumed course is deviating slightly from the true course, a new assumed course should be drawn based on as many ballistic points as appear to form a new ballistic course.

Rule 4. If after adjustment has been obtained, shots again begin to fall in the same sense with increasing magnitude of deviation, change the course by deviating it to the ballistic course indicated by three or more ballistic points in the same sense. (This would indicate that the target is changing its course.)

Rule 5. With large dispersion, when the probable error is greater than 150 yards, the direction of the course should not be changed until at least five spots clearly indicate the assumed course to be in error. Reason—when dispersion is large, the initial data is no doubt more accurate than that obtained from the fall of only three shots. However, the above rule should not be followed with a gun of small dispersion.

Battery Commander's Narrative Report of the Practice of May 13, 1932.

Extracts of the Battery Commander's narrative report of the 16 inch gun firing of May 13, 1932, are herewith quoted. The accompanying composite plot should be studied to better understand the narrative report.

The composite plot was made after each practice. It shows the true course of the target and its true bal-

listic (setforward point) course as obtained from the horizontal base track of the Safety Section. Placed with this track was the firing battery's plot showing the plotter's assumed initial course and the assumed ballistic course as determined from the results of fire. Additional data is indicated by the following legend which was placed on each composite plot:

11:34	9:30	9:10	39900	39900
11:40	13:80	13:60	40800	40815
11:43	12:40	12:20	39000	39010
11:44	9:50	9:30	41300	41290
11:47	10:85	10:65	37800	39800

b. All initial points received from the airplane after 11:34 A.M. were so obviously erratic that they could not be used. The positions given at 11:40 A.M.; 11:43 A.M.; 11:44 A.M.; and 11:47 A.M. were behind those given from 11:26 A.M. to 11:34 A.M. inclusive. This would indicate the target traveling in an opposite direction from its initial direction and such data was disregarded. Time "one" was announced at 11:35 A.M. At 11:32 A.M. an azimuth of course based on aerial observations was received from the Compass Plotting Station as 263°. This course was drawn on the Plotting Board thru the mean of the first four plotted target positions as given above.

c. The Plotted position of the target at 11:34 A.M. was projected to the assumed course of the target and travel computed between 11:26 A.M. and 11:34 A.M. i.e., as 160 yards per minute.

(a) The firing interval for this practice was to be three minutes. Data was computed on one minute intervals using a Time Interval bell of one minute.

d. The Plotter made his first prediction for bell 19 but the prediction was declared "dangerous" by the Safety Section. He then moved back in azimuth 1025 yards, predicted for time 21 which was also declared "dangerous." He again went back in azimuth 1025 yards and predicted for time 23. This was declared "dangerous" and the operation was repeated for time 25. This was "safe" but relayed at guns.

e. Prediction for time 27 was declared "safe" and the first shot fired from gun No. 2 on bell time 27. The aerial observer spotted the splash at 3 o'clock, 2,000 yards. As this spot was received a new course was received from the Compass Plotting Station as 293°. The target's last assumed position as determined by the Firing Section Plotter was placed on this new course. The spot was plotted from this position and a full correction made on a parallel course.

f. From time 27 until time 38 the gun was inspected by the Ordnance Machinist and the Battery Commander. Prediction for time 39 was declared "safe" and the second shot fired on bell time 39. The spot was 5:30 o'clock, 1500 yards. A full correction was made on a parallel course.

g. Data for bells 42, 43 and 44 were relayed due to work at the guns in changing pressure plugs, checking elevation after last shot by calibrated quadrant and traversing the gun as the traversing clutch was jammed.

h. Prediction for bell time 45 being "safe" the third shot was fired on that bell. The spot was reported

2:30 o'clock, 1,000 yards. A full correction was made on a parallel course. Travel was increased from 160 yards per minute to 200 yards per minute. This bold correction in travel, early in the practice, was to obtain a bracket to be used in adjusting the travel.

i. Times between bell time 46 and bell time 53 were utilized in the same manner as that reported for the second shot. A prediction for bell time 54 having been declared "safe" the fourth shot was fired on that bell. The spot was first reported as "deflection left" over 800 yards. This was followed by a second radio stating the spot as 10 o'clock, 300 yards. As these spots were in the opposite sense for range and the same sense for deflection, one of them was obviously erroneous. They were disregarded for range and predictions continued along the same course with a correction in azimuth. The target was now bracketed in "travel" and travel was reduced to 180 yards per minute.

j. Times from bell time 55 to bell time 60 were utilized at the guns and considered "relays" by the Plotting Room. A prediction for bell time 61 was safe and the fifth shot fired on that bell. Spot 2:30 o'clock, 200 yards. The last four "spots" were now considered and a new course drawn thru the mean of these "spots."

k. The sixth shot was fired on bell time 66, resulting in a spot of 9 o'clock, 500 yards. The assumed course had now been crossed. A half correction in range was made on a parallel course.

l. The times between bells 67 and 73 were relayed at the guns while the Ordnance Machinist worked on the traversing clutch. The seventh shot was then fired on bell time 74, resulting in a spot of 3 o'clock, 70 yards. No correction was made.

m. The eighth shot was next fired on bell time 78. This spot was reported as 8:30 o'clock, 5,000 yards. This was obviously both an erroneous spot and a "wild" shot. It was disregarded.

n. The ninth shot was fired on bell time 83. The spot was 8:30 o'clock, 50 yards. No correction was made.

o. The last (10th) shot was fired on bell time 87. The spot was 8:30 o'clock, 350 yards.

Comments.

c. The initial positions of the target determined at the Compass Plotting Station based on relocated points obtained from the airplane using the Radio Direction Position Finding System, were the most erratic of any received by the Firing Section in any of the previous Long Range Firings or drills. A course could not be determined by the plotter. The one first used was received from the aerial observer and relayed thru the Compass Plotting Station as 263°. The true course of 248.5° was obtained after the practice from the Safety Section, thus showing that the aerial observer's original estimate of the course was 21.5° in error. It will be remembered that the course was changed by the aerial observer after the first shot to one of 293°. This latter course was accepted and used. Comparison with the course of the Safety Section shows the assumed course to have been 8.5° in error.

d. These erroneous courses added to the Plotter's difficulties in getting an early adjustment by the method of shifting his assumed course. However, had he taken the mean of the two courses given by the aerial observer, his course between the second and third shots would have been 278—only 5.5 in error.

(1) The true ballistic course of the target at the finish was 283.

(2) The true course of the target at the finish was 286.5.

(3) The Plotter's course at the finish as a result of his adjustment of fire was 284.0.

e. (1) The true travel at the finish was 195 yards per minute.

(2) The true travel at the finish was 185 yards per minute.

(3) The Plotter's assumed travel at the start was 160 yards per minute.

(4) The Plotter's assumed travel at the finish was 180 yards per minute.

f. Of the last seven shots, (disregarding the wild shot) four were "short" of the assumed ballistic course and three were "over", indicating that the Plotter's range was fairly well adjusted to his assumed course. It is interesting to note that shot No. 7 was bow-on hit on a hypothetical battleship target. In view of the few rounds available for adjustment (seven rounds) and the "blind" method of position finding, this hit is very gratifying.

g. The plotted deviation of the 8th shot, "wild shot," was 2600 yards short. This deviation cannot be accounted for. The records show that the ramming was uniform as a measurement of space between base of projectile and face of breech, was made before each shot. The jump of the gun on this shot was the same as on all other shots as measured by calibrated quadrant before and after the shot. The weights of both powder and projectile corresponded to the average of all other shots. The pressure developed on this shot corresponded to the average pressure of all other shots and the measurement of recoil corresponded to that of the average of all other shots. The dimension of the projectile was the same as that of all other projectiles. Therefore, it would seem that the projectile used on this round developed same ballistic defect while on its

trajectory, i.e., that it lost its ballistic cap, or its rotating band or its base cover, etc.

* * *

j. Only one material defect developed during the firing. The traversing clutch slipped on the 3rd, 5th and 7th shots. In order to not delay fire the gun was quickly depressed, primer removed and the gun crew directed to push the gun and carriage in azimuth—all hands pushing on the gun.

k. There were no primer failures. No relays were caused by personnel errors. All relays were due to the time required to exchange pressure plugs after each shot or to the slipping traversing clutch referred to above.

l. The DPAE was 243 yards, whereas the Firing Table DPAE, for the average range of this shoot (39,203 yards) was given as 130 yards. It is interesting to note that four of the ten shots fell within the fifty per cent zone.

m. An instrument to be used by the aerial observer that would give the firing battery a close approximation of the course of the target would be very valuable.

n. The use of Radio Direction Finders to locate the aerial observer while involving a sizeable error in initial data, proved to be of value when the tactical situation prevents terrestrial observers from tracking the airplane or prevents the aerial observer from using land marks.

o. The Plotter should be an officer familiar with the average error of the aerial observer and the average "lag" effect due to the slanting antennae on the plane.

p. The plot of the airplane's position should be put directly on the plotting board of the firing battery in order to save time and personnel.

* * *

(4) Examination of the Composite Plot indicates that the rules of adjustment worked very well. Although a spotting error on shot No. 2 delayed adjustment for range, such adjustment was obtained on shot No. 4. Adjustment of the course was obtained on shot No. 10.

(5) The average error of the entire aerial-position finding system for this practice was 819 yards. As adjustment for range, travel and deflection are all based upon positions of the target as determined from the reported fall of shots, it is obvious that the plotter of the firing section is dependent upon the accuracy of "spotting" of the aerial observer.



The Target Practice of Battery C, 91st C.A.(PS)

By Captain H. P. Hennessy, Coast Artillery Corps



AUTHOR'S NOTE: How to write about a target practice?

I have written this article by invitation. In asking me to do so, the Editor of the JOURNAL was, no doubt, animated by the belief that the facts concerning any target practice which won the Knox Trophy award were such as to be interesting to some, informative to others, and both interesting and informative to still a third group; that is, provided these facts were properly presented.

I have discovered that it is by no means an easy task to present these facts properly. In writing such an article, one should be, as I say, both interesting and informative; but interest leans heavily on brevity

for support, and how to be brief, yet informative? That is the question,—a very nice question.

In the article which follows, I have endeavored to: first, render the justice that is due them to the officers and men associated with me in winning the Knox Trophy for this year, and, second, to set forth the things which I have learned about firing mortars.

I make no claims of original discovery of the things which I have learned. To most of my readers, they will be as well known as a thrice-told tale. However, somewhere, there may be someone to whom this article will be of interest or of informative value, and to such a person, or persons, I respectfully dedicate it.

TO my mind, the success of Battery C, 91st Coast Artillery (Philippine Scouts), in winning the Knox Trophy this year, can be laid to the following factors:

- A group of loyal, hard-working and efficient enlisted men.
- Battery officers who not only knew their business, but who also had the ability, initiative and industry to see that the men under their immediate supervision were thoroughly trained in their duties, and, as well the energy and will to see that these men performed their duties properly.
- The most sympathetic and understanding leadership, throughout the entire chain of command at Fort Mills, that it has ever been my good fortune to receive.
- More than a fair share of good luck.
- The absence of any special or pet "gadgets" in our fire control system.

I think it well to elaborate on the above statements a little, so let us take them in the order in which they are listed:

a. The men—The men of Battery C of the 91st Coast Artillery, are as fine a group as I have ever had the good fortune to command.

I feel that I cannot say too much in appreciation of their efforts during the time I was in command of Battery C. They responded to every demand that was made of them in the finest possible spirit.

It was with the keenest feelings of regret that I left them, when I was ordered to duty in the States.

b. The battery officers—It is very seldom indeed that a battery commander has the good fortune to have such able lieutenants as I had with me during the time I was in command of Battery C. Such able officers as Lieutenants David Hottenstein, Leland Smith and Paul Leahy have, I believe, few equals and no superiors in their grade, in the Coast Artillery Corps at least. I am confident that anyone who knows these officers will support me in this statement.

c. The chain of command—As I see it, from the bases of support and assistance from the higher command, Corregidor, during my time, was a battery commander's paradise. To a degree that I have never seen approached anywhere else, the unit commander at Corregidor was given all possible opportunity and support in the training and administration of his command. The task having been assigned, the battery commander was given all possible latitude and assistance in accomplishing it. In short, the spirit that manifested itself in every possible way, was that of the What-can-I-do-to-help-you? variety. I do not mean to imply by this that no attention was paid to the progress of work or training. Rather, the contrary was the case; but such criticism as was offered was always of the constructive variety, and, at all times, the attitude of helpfulness and appreciation of effort was manifest.

d. The luck—What can you say about luck? You either have it or you don't. As the English say, "Your number is up or it isn't—and there is nothing you can do about it either way, don't you know!"

I wish to say, here and now, that when a battery places nineteen out of twenty shots on the bow-on target for range, and eighteen of those shots on the same target, for deflection, as Battery C did in this year's practice, its "number is up,"—rather! I would be very ungrateful if I did not render due thanks to Dame Fortune, but, in all fairness it must



Commence Firing. (Notice Burlap Staked to the Ground Above Pit.)

be conceded that the battery did everything it could to place itself in a position to profit by all the "breaks" in its favor.

e. *The gadgets*—Everything in our fire control system bore the stamp of official approval. We used



Some of the Earlier Salvos in the Shoot (Burlap Still in Place).

nothing new, novel or original. It seems to me that the main purpose of target practice is to train the battery as a whole for action, and that if, at the conclusion of its practices, the battery is not left with an increased feeling of confidence in its ability to fire, the target practice season is more or less a failure. I have seen more than one practice spoiled simply and solely because someone regarded the shoot as research work rather than as a target practice. To my mind, the proper agency for the development of new devices, is the Coast Artillery Board, and, if I ever conceive a new device or "gadget," without which I believe the Corps cannot get along, I shall send it to the Board. The chances are good that the Board would find that such device had been tried and rejected, for the first time, during what I would call the "Whistler-Hearn" era of Coast Artillery development, and further, that, in some form or other, it had been submitted and rejected at least once every three years since that time.

I am all for improvements in our system of fire control; but not at the expense of the firing battery.

The foundations for the winning of the Knox

Trophy by Battery C may be said to have been laid in the training season that culminated with the target practice for 1931, for, with the practice of that year, all mortar batteries were assigned a problem that was radically different from that which they had been solving for some years previous to that time.

The essential difference was in the requirement that mortar battery practices had to be fired in at least two zones, *with preliminary adjustment data for one zone only, being available*. The requirements of the problem called also, for an approximately even distribution of the shots fired in record practice, between the zones, with, to my mind, a rather heavy penalty for failure to meet this requirement.

I had never fired mortars prior to the practice of 1931, and was somewhat at a loss, for some time, as to the method to be followed in solving the problem. Finally, it was decided to study all available records of previous practices that had been held by the battery, at the ranges and zones in which the practice of 1931 was scheduled to be fired.

The deviations that obtained in the practices studied, were stripped and compared, when it was found that, on the average, all shots fired in Zone VI, as compared with those fired in Zone VII, had carried 2.1 per cent further in range, and .30 degrees to the left, in deflection. Zones VI and VII were studied, because it was expected to fire the practice in these zones. (It might be apropos to say here, that the factor governing the selection of the zones, was the condition of the various lots of powder at the battery. Every year, the Ordnance detachment at Corregidor tests all powder on hand, and those lots which, though still usable, give the most positive indications of deterioration, are used in target practice. It so happened that during the period I was in command of Battery C, a certain lot of powder, made up in great part into Zone VI and VII charges, was showing the most definite signs of instability; hence this lot was designated for use.)

The values, thus obtained, were applied as arbitrary corrections in changing zones in the 1931 practice, and the subsequent results were, on the whole, so satisfactory, that it was decided to follow the same procedure in the 1932 practice. However, in the 1932 practice, the arbitrary correction in range for the zone-to-zone change, was made in terms of muzzle velocity, rather than as an arbitrary adjustment correction on the range percentage corrector.

In both the 1931 and 1932 practices, the last adjustment corrections that had obtained in the first zone of the practices, were carried into the second zone. This procedure worked extremely well for the mortars to which Battery C is assigned, those of A Pit, Battery Geary.

In each practice, trial shots were fired at a fixed point, and the corrections indicated as a result thereof, applied in the routine manner. These trial shots were fired at the expected mid-point of the zone in which fire was to be opened.

Adjustment in the first zone of record fire was by the magnitude method of adjustment. Adjustment in the

second zone was to be by what, in effect, was the successive approximations method.

The reasons for the adoption of this rather unusual procedure were these:

a. Due to the small number of salvos available for adjustment in the second zone, (it was possible that no more than four salvos would be available) it was felt that some attempt at adjustment should be made as soon as possible.

b. It was believed that the chances were good that the true location of the center of impact would be disclosed by the first salvo in the new zone.

c. The net result obtained from taking the mean of the deviations of the first two salvos, upon which to base a correction, is identical with that which would be obtained by taking the full correction for the deviation of the first salvo and applying it to the second, and applying a correction equal to one half the deviation of the second salvo to the third salvo. This second method possesses the added advantage that the first correction applied might put the center of impact on the target, making any further correction unnecessary. (This was, in fact, the case with this year's practice.)

The proposed use of this method of adjustment for the second zone—I say, proposed, because, in the 1931 practice, the arbitrary zone-to-zone correction, applied to the first salvo in the new zone, placed the center of impact on the target, while in the 1932 practice, this same zone-to-zone correction placed the center of impact so close to the target that only one correction was necessary,—has come in for some criticism. However, I believe that, in the solution of the special problem assigned mortar batteries, its use has some justification.

The time allowance granted for adjustment in the second zone, was taken, in each practice, immediately after the first salvo in the zone was fired. Firing was then suspended until the fall of the first salvo in the new zone had been observed.

The experience gained in the practice of 1931, was invaluable to us in indicating the points that were to be stressed in the training for the 1932 practice. Because a knowledge of these points might be of value to those who may be called upon to fire mortars for the first time, it is felt that it may be worth while to indicate what these points were, in our organization at least. They were:

a. The necessity of obtaining an even distribution of shots between the zones.

b. The imperative need for an adjustment at the earliest possible moment, in the second zone.

c. The extreme importance of accurate spotting, especially for the first two salvos in the second zone.

d. The ability, upon the part of the range officer to tell, by inspection of the course, just when fire should be opened. This, in order that at least four salvos might be fired in the first zone, and a

zone change made, without having to wait for the target to come into the second zone.

e. The necessity for the range officer to know the rules of adjustment thoroughly, and to be able to apply them without hesitation, when necessary.

f. The demand for some check that would insure that all data-computing devices, instruments and other elements of the fire control system made the change to the second zone at the proper time.

Training to improve the functioning of the battery, with respect to the points indicated above, was conducted this year, along the following lines:

a. A part (at the start, the greater part) of each training period was placed at the disposal of the officers in charge of the various details, for such drill as, in their opinion, was necessary or desirable. In order that the battery might be thoroughly familiar with the conditions that might be encountered during target practice, "canned data," covering courses similar in range and azimuth to the expected target practice courses, was used a great deal during this period of training. At the same time, all possible opportunities that came our way to give the battery practice at tracking actual moving vessels were seized.

b. A drill, of the battery as a unit, simulating target practice conditions, was held daily and a careful analysis made. At the start of the training the range officer ran a graph of the errors made by the range section



Burlap Still in Place—No Dust.

in these drills, but, as time went on, it was found unnecessary to do this.

c. So far as possible, sub-caliber practice was held under conditions approximating as closely as possible, the conditions that would obtain during target practice.

d. When ever any other unit on Corregidor, whose field of fire was visible from any of the stations accessible to the battery, held either sub-caliber or service practice, the stations from which the proper water area could be seen were manned, by the spotting section of the battery, which was thus able to get much valuable practical experience in spotting actual splashes. The results obtained were checked, when possible, against those obtained by the battery firing, and as well, against the actual plotted deviations. The work of this unit left much to be desired at first; but



AFTER THE PRACTICE

Gen. Kilbourne and Col. Williford at the Battery. Gen. Kilbourne Congratulates Crew.

its work rapidly improved, and, at the time of target practice, the spotting section was able to obtain most excellent results, as the records of the practice will show.

e. During at least one practice course daily, the range officer was required to adjust fire. For this purpose, the usual equipment consisting of a hit bag, impact board, colored pins and adjustment boards for both range and deflection were used. The assumed centers of impact were moved in accordance with the directions of the range officer, who, of course, could not see the board, and based his corrections on the sensings given him by the battery commander. These deviations were, in turn, based on the deviations from the assumed center of impact as indicated by the discs drawn from the hit bag.

The training outlined above was not by any means without incident or error. On one occasion, the pit executive inserted a number of supposed malfunctions into the drill of his mortar crews. As a result, when the drill was over, it was found that the division of shots between the zones did not conform to the requirements laid down for target practice. It was apparent that some provision would have to be made to insure that this did not happen during service practice. Accordingly, it was arranged that a report of the number of shots fired in each salvo would be sent over the intelligence line from the pit, immediately after the salvo was fired.

On another occasion, the deflection board operator failed to shift his wind and drift correction chart to the proper zone, when making the zone change. This led the range officer to lay out a regular system of checking all boards and devices in the plotting room when the zone change became necessary. Due to the constricted area of the plotting room, it was necessary for the range officer to get the motions he went through, in checking these boards and devices, refined to the precision of a well-executed football shift. He must have covered three miles in practicing these movements, but, judging from the way he and his section functioned during the service practice, his efforts were well worth the trouble.

As I have mentioned before, the required ability, on the part of the range officer, to estimate the proper point on any given course at which to open fire, so that the provisions of the target practice directive could be complied with, was of great importance. Any failure on his part to make a proper estimate, was bound to affect the battery adversely; in fact, such a failure on his part might well have spoiled the practice entirely. The importance of this estimate can be more readily realized when one remembers the injunction in the directive that the shots fired in a mortar practice must be evenly distributed between the zones. In a case where firing was started too late, it might so happen that only three salvos could be fired in the first zone. The result would be that the towing vessel would have to return to the start of the course, either immediately, or upon the conclusion of the portion of the shoot that was fired in the second zone, and run the course over again. The effect on the personnel in such a case might not be good. Also, a considerable period of time would have to elapse before firing could be resumed, and it is very questionable that the adjustment data obtained on the first leg of the course would be of much value.

The question also arises as to whether the time consumed in sending the towing vessel back to the start of the course would be allowed the battery. I had my doubts that it would be.

It was also possible, of course, to start firing too soon. In this case, at the time the zone change was called for, the target might not have come into the new zone, with the result that one or more relays would have to be taken until the target was in the zone. I doubted that the time consumed by these relays would be allowed the battery.

All in all, it was considered to be very much to the interest of the battery that the range officer be able to make a proper estimate as to the time to open fire. No member of the battery had a keener realization of this necessity than did the range officer. He put in many weary hours acquiring accuracy in making this estimation, and, therefore, when the practice was over, we had nothing to explain. I am sure he feels, as I do, that the time he had to put in on this one element of training was justified by the results of the practice.

The efforts put forth by the men of the range section in preparing for service practice, were fully equalled

by the details in the pit. Because the changes in the method of conducting mortar practices affected the work of the range section to a greater degree than they did that of the mortar crews, I felt it advisable to give the range and spotting sections most of my attention. However, the mortar crews soon showed that they could get along very well on their own, and when, on the occasion of one visit, I found them exercising the mortars for the third time in two weeks, I was satisfied that if hard work could accomplish it, they would be ready for service practice on the day appointed. From that time, my visits to the pit were cut to a minimum.

One little expedient resorted to by the pit detail deserves mention, I believe. As Idaho is noted for its potatoes, so is A Pit, Geary, noted for its dust during target practice. For years dust has been the bugbear of the pit details. After the first salvo, the air has been full of it, so I have been told. It has blinded the gunners, obscured the data boards, and helped jam the breech blocks.

It was the subject of considerable concern to us in preparing for the 1931 practice. One day, the proposition of laying strips of burlap over the bare ground of the parapet, staking and tying it down, and, for several days prior to the practice, soaking it thoroughly with water, was advanced as a possible solution to the dust problem. Because of the lack of any other satisfactory means, it was decided to try this expedient. When the burlap was in place, it looked like a very crude attempt at camouflage, and was the subject of much jocular comment on the part of everyone who saw it.

When the first salvo of the 1931 practice was fired, I set myself to see a shower of burlap, stakes and wire rise into the air. To my great relief, nothing of the sort happened. I did not see any dust, either. As put down in 1931, the burlap was a complete success. It held its position well, and kept the dust down almost entirely.

It was put down again for the 1932 practice and again performed its dust-restraining functions satisfactorily, although, as not quite the same amount of

anchorage was used as was employed in 1931, quite a bit of it had worked loose at the end of the practice.

Based on these experiences, I recommend, the use of this expedient to any battery commander plagued with dust in his gun position during firing. I would offer just one caution; stake it down well!

It might be argued that this expedient has no practical wartime application. I believe that it has. In the first place, I believe that the burlap can be fastened in place securely, and in the second, that it would work very nicely into the scheme of camouflaging the battery.

As the day of the 1932 practice approached, it began to be apparent that the battery would be ready, when its time came to fire. The prediction tests were giving excellent results, the columns of differences on the plotting room and pit check-back boards in my station indicated a smooth flow of data that was getting over the lines correctly and quickly, and the mortars, if the "Ready" signal from the pit was any indication, (and it was), were being laid with plenty of time to spare.

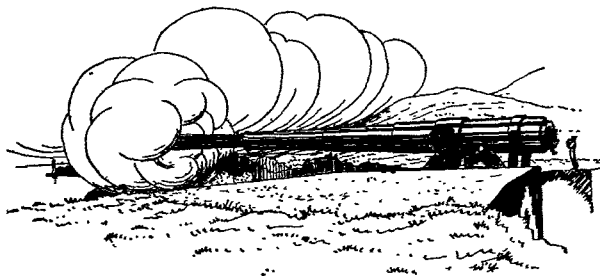
It was felt that the time had come to curtail to some degree, the training of the battery, and, for the last week of training, drills were cut to the minimum necessary to insure that all devices and communications were in working order.

On the day before the practice, I visited the plotting room and the pit, to find the officers in charge trying to think of something to do. But they were at the end of their resources; everything they could think of, had been done, and the only thing they could suggest was that they and their men be allowed to go away and forget all about target practice.

I walked away, reflecting that the battery was either very bad or very good, and that one way or another, it was due for a surprising practice the next day—surprisingly bad, or surprisingly good.

I was quite disturbed about it all, because a great many of the unpleasant things which have occurred to enterprises or activities in which I have been interested, have happened on days, and at times, when I thought I had the situation well in hand. It does beat all, the things one can overlook at times!

The Gods, however, were kind.



The Organization and Training of the Territorial Army

By Colonel G. R. Codrington, C. B., D. S. O., O. B. E., T. D.

EDITOR'S NOTE: *Thinking that many of our readers would be interested in the British Reserve system we asked Colonel Codrington to write the following article. This is a large subject to cover in the space allotted but Colonel Codrington has accomplished it in a very pleasing and informative manner.*

TO understand the British Territorial Army thoroughly it is necessary first to describe in general terms how that Army came into being and the elements out of which it was formed.

In the eighteenth and nineteenth centuries there existed in England many volunteer units which formed the auxiliary forces, such units being raised locally either under the personal leadership of someone prominent in the locality, or as the contribution of some large town. A few units existed even prior to this, notably the trained bands of the City of London, from which springs in continuous descent the Honourable Artillery Company of today. In these original auxiliary forces the "Volunteer Infantry" was quite distinct from the "Yeomanry Cavalry," not only as to their liability to service, but also as to their training, control and emoluments. The several units were all distinct and separate from each other and can have been of doubtful military value taken as a whole, although many corps reached individually a relatively high standard of efficiency and marksmanship.

Considerable impetus was given to the recruitment of such corps at the time of the French Revolution, and, for instance, most of the Yeomanry Cavalry Regiments date from 1794 when Carnot's threat of invasion produced the necessity of increasing the cavalry resources of the country. These Yeomanry and Volunteer forces remained on a purely local basis and supported by local subscriptions till quite a later date. For instance, when additional Cavalry were required for the South African War of 1899-1902 each Regiment of Yeomanry Cavalry was asked to produce volunteers, and the composite units thus formed received pay and maintenance like the Regular Army on arrival at the Cape, but the cost of raising, equipping, (except arms), clothing, horses and sea transport to the Cape was met entirely by local subscription.

Such was the state of affairs when in 1907 Lord Haldane (then Mr. Haldane, Secretary of State for War) decided that the time had come to co-ordinate all these separate Auxiliary entities into one Second Line Army, properly constituted on a modern military basis in such a way that in any national emergency they would in very fact be a reliable and useful Second Line to the Regular Army; and in that year was passed the Territorial and Reserve Forces Act as a result of which all the existing units were remodelled on a proper military basis. In certain cases new units were raised to fit in with this scheme, while in others

the existing volunteer units were expanded or re-organised. In some cases, too, the names and designations of units were changed, and all infantry units were made actually part and parcel of the Regular Line Regiments, every Line Infantry Regiment, as a general rule, being given two Territorial battalions. Thus each of the Territorial battalions became inheritors of the Regimental history of their Regiment in the same way as the Regular battalions.

The Territorial Reserve Forces Act 1907 provided for organization in complete divisions and army troops. Men were enlisted on definite and fixed terms of engagement for Home Service only, and were not liable to be called out in aid of the civil power as had been the old Yeomanry Cavalry. Either on enlistment, or at any time during their service, members of the Territorial Force could sign an undertaking to serve overseas if required, and those who undertook this additional obligation were known as Imperial Service Members.

Thus by 1914, when the Great War came, there was behind the Regular Army a complete and properly organised and equipped Second Army, instead of semi-independent corps with no military formation, and moreover a Second Army with a very fair standard of training.

During the course of the War most of the Territorial divisions eventually proceeded overseas as such, while in some cases individual units which had already reached a particularly high standard of efficiency were sent out independently, their places at home being taken by second line units newly raised.

After the war the Territorial Force was disembodied and there was a delay of a few months while the future military policy was decided. Eventually it was decided to modify the original scheme of 1907 in certain ways, and recruiting was opened for a reconstituted Territorial Force under the new name of the Territorial Army. Fundamentally the two are the same, the difference being essentially of detail, except for an important alteration in conditions of service which is dealt with later.

The Territorial Army exists and is raised on the authority of the Territorial Army and Militia Act 1921. The chief purpose of this Act was to change the name from The Territorial Force to The Territorial Army, the framework of the organization remaining as was provided by the 1907 Act. The change of name may seem a small thing, but it was significant and in-

dicative of definite policy, for instead of being regarded as an entirely separate organization the Territorial Army is now regarded definitely as the Territorial portion of the one Army of the country.

Enough has been said to shew the history of the Territorial Army and its evolution from the old elements which had their beginnings a long way back in the military history of the country, and it is now proposed to describe in detail the working of the Territorial Army of today.

The organization and training of the Territorial Army is carried out through two entirely separate yet closely interwoven chains of responsibility. The administrative side of the work is carried out through County Territorial Associations controlled ultimately by the Territorial Army Directorate at the War Office, and the training through the ordinary military channels. It will be well to deal with the administrative side first.

The Territorial Army is raised in Great Britain only, Ireland not being included in the scheme. The units while being grouped in military formations and commands for purposes of training, are raised and administered on a county basis, each county being given a quota of the whole for which it is responsible. In each county, therefore, there is constituted an Association whose duty it is to see to the raising and administration of its own quota. The Lord Lieutenant of the County is the president of the County Association, the size of which varies with the size and importance of the county. On the average an Association consists of about thirty members which are made up of the following:—representatives of all arms and branches of the Territorial Army raised within their jurisdiction; representatives of the County and Borough Councils; co-opted members of employers' or workmen's organizations; co-opted "military members" who are retired officers living in the area, whose experience is likely to be of value to the Association in carrying out its functions. It is essential that the full co-operation of employers of labour be assured, as it is they to whom the county looks for the granting of facilities to such of their employees as are serving in the Territorial Army to attend their annual training, and it is for this reason that they are represented on the County Associations.

On the Associations thus formed are laid the following duties:—

- (i) The organization of the units and their administration, including maintenance, at all times other than when they are called out for training or actual military service, or when embodied;
- (ii) The recruiting for those units both in peace and war;
- (iii) The provision and maintenance of rifle ranges, buildings, magazines and camp sites;
- (iv) Facilitating the provision of areas for manoeuvres;
- (v) Arranging with employers of labour as to holidays for training, and ascertaining the times of training best suited to the circumstances of civil life;

(vi) The provision of horses for the peace requirements of the Territorial Army;

(vii) Provision of accommodation for the safe custody of arms and equipment;

(viii) The supply of requirements of their units on mobilization in so far as the Army Council shall direct that those requirements shall be met locally;

(ix) The payment of separation and other allowances to the families of men serving in the Territorial Army when embodied or called out on actual military service;

(x) The registration of horses for use of the Army on mobilization;

(xi) The care of reservists and discharged soldiers.

To meet the cost of these various services the Army Council pays over to the Associations such sums out of money voted by Parliament for the Territorial Army as are necessary, the sums being calculated on a capitation or other basis as laid down from time to time. Within certain limits which are clearly defined, the money, calculated under the various heads, may be pooled by an Association for general use over all the services for which it is granted. Associations have to account annually to the War Office, their accounts being rendered in a prescribed form and subject to audit.

In practice the work of an Association is done mainly in Committee, the officers commanding the units being members of the various Committees, these Committees making report to the statutory quarterly meetings of the full Association. In practice, too, the actual work of recruiting men and selecting young officers devolves on the Commanding Officers who are, of course, responsible to their County Associations for the performance of this work.

The President of the County Association as His Majesty's Lieutenant for the county has the right of nominating candidates for appointment to commissions as officers in the lowest rank, and failing the exercise of that right the nomination rests with the Commanding Officer. Candidates for such appointment are required to possess qualifications laid down from time to time by the Army Council. In a good unit, with a keen Commanding Officer, there is usually maintained a candidates book in which prospective officers are entered before they become eligible. Most of the units being old units with a long history of their own, and developed rather than changed in form, there is just as strong a pride and esprit de corps as in any regular unit, and sons follow on into their father's regiments.

Other ranks on enlistment must be not less than 18 nor more than 38 years of age and must pass a test of physical standard. The term of service is four years, at the end of which period there may be further re-engagements for terms of one, two, three or four years as decided by the County Association concerned, up to a maximum age of 50 in the case of sergeants or 40 in the case of rank and file.

Officers of the Territorial Army are at all times subject to Military Law as are Regular Officers, but other ranks are only so subject when they are being trained or exercised either alone or with any part of the reg-

ular forces, when attached to or otherwise acting as part of the regular forces, when embodied, or when called out for actual military service. Officers and men of the Territorial Army are not liable to be called out in aid of the civil power as a military body, but when embodied or otherwise subject to Military Law as described above they are in the same position as officers and men of the regular forces with regard to duties of this nature.

One condition of service has been altered since the Great War. The old Territorial Force was raised definitely for home defense only, and any volunteering for foreign service was a matter of individuals only, although all the individuals of a unit might, and often did, so volunteer. Now, however, the Territorial Army has been reconstituted for the purpose of Imperial defence, and for this purpose every officer and man is required to accept liability for service overseas, but he cannot (unless he volunteers) actually be sent overseas until an Act of Parliament authorising the despatch of the Territorial Army overseas has been passed.

The Territorial Army can only be embodied when the Army Reserve has been called out by Royal Proclamation in the case of "imminent national danger or great emergency," the occasion being first communicated to Parliament if sitting. If Parliament is not sitting, it must be called together within ten days of the issue of this Proclamation. A point on which members of the Territorial Army lay very great store is the regulation which lays down that men of the Territorial Army despatched abroad under the authority of an Act of Parliament will not be used for the purpose of supplying drafts for the Regular Army. They will serve together in regimental units. Where in case of special military emergency attachments of men from one unit to another are inevitable, such attachments will be temporary and the men so attached will be returned to their own units at the first opportunity.

The effect of this reservation is very far reaching, for it means that now more than ever is the Territorial Army rightly considered the true second line to the Regular Army—in fact the Director General of the Territorial Army in a recent speech described the position by saying that while the Regular Army was the advance guard, the Territorial Army, in its own units and formations, was the main body.

The members of the Territorial Army, both officers and other ranks receive the pay and allowances of their rank at the same rates as the Regular Army when actually assembled for annual training, when called up for special duty, when attending courses of instruction and when embodied. No pay or allowances are drawn for attendances at drills etc. performed for qualification outside the period of annual camp.

The provision of horses for mounted units is carried out either by the County Association or by the individual. In either case a grant of £6 is made per horse for a camp of 15 days, or 8/- per day for odd days. In practice Associations usually contract for the supply of horses for infantry chargers and for draught purposes, while in the case of most of the Yeomanry

Regiments the individuals usually supply their own. It matters not whether a man undertaking the supply of his own horse is actually the legal owner of that horse. In many Yeomanry Regiments where the personnel are composed largely of the original class of Yeoman farmers the men do actually provide their own horses, but failing this a man will make his own terms with a neighbouring farmer or with a horse dealer and so long as he reports in camp complete with a horse which passes a board of inspection as to its fitness and suitability on arrival, he is entitled himself to draw his horse allowance.

As regards transport, certain vehicles are held on charge by units, and lorries, tractors etc. are held by Associations or provided on loan for annual training by corresponding Regular units. Guns, armoured cars etc. are held on charge of units, but sometimes on an establishment less than the full complement, but sufficient for instructional purposes, the members being made up from Regular sources for annual training. Tents and stores required for annual training are drawn from the Regular Army stores by units on indent as and when required, up to a definite scale laid down in the Regulations.

Only Service dress clothing is provided free, to the scale of two suits per man, but Associations are allowed to draw on payment from army stocks full dress for bands, etc. Walking out dress is allowed so long as no expense is incurred to the public and in many units the men provide themselves with such clothing at their own expense. Clothing thus provided must conform to the regulation pattern. Drills and instruction other than the annual training and courses or attachments to regular units are carried out in plain clothes, and therefore the wear and tear on uniform is actually not great, for it is only worn on few occasions outside the annual training.

Thus, in general outline the administrative side of the Territorial Army.

As regards training, as has been stated above, this is in no way the concern of the County Associations, but is carried out through the direct military channels. The Territorial Army altogether makes up two cavalry brigades, fourteen divisions, and army troops. The infantry of each division consists of three brigades of four battalions each; these formations, according to their geographical distribution form part of the ordinary military commands into which the whole country is divided, there being two divisions in the Eastern Command, two in the London District, three in the Northern, two in the Scottish, two in the Southern and three in the Western Commands. The Divisional Commanders are at present all regular officers, although it is possible for Territorial Officers to be appointed to such commands should any be found who are sufficiently qualified, but no such appointments, however, have ever yet been made. In a few cases the brigade commands are held by Territorial Officers.

To each unit is attached a regular officer as adjutant and a certain number of senior regular N. C. O.'s as Permanent Staff Instructors. The number of such Instructors varies with units—a unit that is all con-

centrated in a town at one headquarters naturally requiring a smaller number than one which is scattered having its squadrons, companies or batteries many miles apart. It may be taken, however, as a general basis, that there is one Permanent Staff Instructor in the position of Regimental Sergeant Major at the Unit Headquarters, and one Instructor with each squadron, company or battery. These Permanent Staff Instructors are provided with quarters by the County Association, and besides their work as Instructors in the unit to which they are attached, they also act as recruiters in their district for the Regular Army.

The amount of instruction that is actually obligatory on men of the Territorial Army each year is very small, and consists in a certain number of drills, a period of annual training and a weapon training course. The number of drills required varies with different arms, but the following may be given by way of illustration: Yeomanry, recruits 20, and trained men 10; Artillery, recruits 45, and trained men 20; Infantry, recruits 40, and trained men 10; Armoured Car Companies, recruits 40, and trained men 10. A drill consists of one hour's actual instruction, and up to three drills may be performed in one day. Over and above this there are promotion examinations, both for non-commissioned officers and for officers, as well as various courses of instruction for those who can get away from their civil occupations to attend. In practice every man does very much more than his statutory number of drills, the amount of extra work put in by some men being really remarkable. The annual training camp is a minimum of eight and a maximum of fourteen days, except in the case of Yeomanry, who may do eighteen. Previous notice is sent officially by the officer commanding the unit to the employer of every man in his unit, and while in the vast majority of cases there is very real co-operation on the part of employers, cases do occur not infrequently of an employer who represents that a man can not be spared. In practice there is no remedy for this except a close liaison between the Commanding Officer and the employer, the former enlisting the patriotic co-operation of the latter. Employers vary very greatly, and while some either make difficulties or only let men elect to use their annual holiday by going to camp, there are others who set a very different example. There are firms who are known to post a notice in their works expressing the hope of the management that their men will join the Territorial Army, and granting to all men who render themselves technically efficient their full wages while in camp and their annual holiday as well. On the whole it may be stated that employers are helpful. The annual camp is usually arranged to cover some holiday period—such as Whitsun or August—when the works will in any case be closed for part of the time.

The standard of training that is reached is very high—and often surprises regular officers who visit units for inspection purposes. This is accounted for by the fact that the men who make up the Territorial Army are those who have joined it solely for the opportunity of occupying themselves with their chosen hobby. There is, therefore, an amazing degree of

keenness and zeal such as would not be found in any professional army except in certain isolated individuals. Such men are willing learners and a real joy to instruct, and a very good illustration of this spirit which animates the whole of the Territorial Army has appeared this year. For reasons of National economy the Government reluctantly decided that the annual training of Territorial units must be cancelled for the one year 1932. In spite of this the country has before it the spectacle of whole units volunteering to go out to camps of at least half the normal period without any pay or separation allowance. It is this spirit that brings officers and N. C. O.'s out for week end camps, instructional tours, etc., and in fact, given the right leadership in the Commanding Officer there is nothing that cannot be achieved.

Mention has been made of Regimental pride and esprit de corps, and this also has a material bearing on the question of training. All the units of today (or those from which they sprung, where there has been some modernisation, such as a Yeomanry Regiment converted into an Armoured Car Company) went through the Great War, and many of them the South African War also. Moreover, as has been stated, the Infantry units are simply Territorial battalions forming part of the Regular Regiments, and thus the question of Regimental History and Battle Honours plays a very important part; for instance in one Yeomanry Regiment dating from 1794 and with two campaigns to its credit, the first thing that happens to every young officer and every recruit on joining is that he is given a little book containing an outline of the history of the Regiment in order that he may have some idea of the tradition and history which it will be his privilege to uphold.

Another factor which has an important bearing on training is the very close co-operation which exists between the Regular Army and the Territorial Army. This takes effect through Regular officers being attached to Territorial units during their annual training for the purpose of lecturing, acting as umpires at tactical schemes, and generally assisting in many ways.

There is one side of the Territorial Army which has not yet been touched on, but to which reference must be made in any review which aims at being at all complete, and that is the question of discipline, and in this there lies perhaps one of the most wonderful qualities of the Territorial Army. When assembled for training the men are subject to Military Law and liable to exactly the same penalties for military offences as are regular soldiers, and commanding officers are armed with the same powers under the Army Act as are regular commanding officers. But it is never necessary to exercise these powers, and the spirit animating the Territorial Army right through is such that discipline, and that of a very high standard, is not "enforced" nor "maintained"—it just happens. The secret of this lies partly in the type of man recruited partly in his reason for joining and zeal to do the thing really properly, and in both these factors together being controlled by true leadership on the part of officers who really know their men (and often their

families too), who would not regard Territorial soldiering as worth while if it were all ease and without difficulties to be faced and overcome. There is, however, provision for discharging a man as "not likely to become an efficient soldier" should such a course be necessary.

This high standard which is attained both in training and in discipline is of the utmost importance for one particular reason. The peace establishment of Territorial units is only 60 per cent of their war establishment and there is no Territorial Army Reserve. On mobilization every unit has not only first to recruit at once up to full establishment, (which will no doubt largely be accomplished by the return of time-expired men to their own units) but it must also give birth to a second line or draft finding unit by throwing off a cadre to form a training depot.

It follows from this that every man must be so trained in peace that immediately on mobilization he can be ready to occupy a position at least one step higher than his position at the time of mobilization. The whole idea of the training of the Territorial Army, therefore, is to regard every man as a potential instructor and to train him accordingly. It must be added, however, that while there is no Territorial Army Reserve so far as the other ranks are concerned, there is maintained a Territorial Army Reserve of Officers, which consists of officers who, having served in the Territorial Army, elect to keep their names on a live register on leaving. These officers do no training when

once they have left the active list, but they are available for service on mobilization, and largely from this source would be found the officers for the depots and second line units on mobilization.

There is one last point which must be mentioned. This "part time army" which now exists as the main body of the British Military Forces is a very wonderful thing, and animated by a wonderful spirit, and the question naturally presents itself to the mind: How does the country take it all, and what does it think of these men?

In the old days there was always a sort of sympathetic smile at those who amused themselves at "Saturday night soldiering." That is all now a thing of the past. Officially, although in only a very small way, the men who constitute this Territorial Army are recognised as different from other citizens, in that by the Act which is their charter they are specifically exempted from all jury service and from service as parish officer. It is a very small point, but one which does set a standard and each year in a greater degree the nation does "take its hat off" to these men for what they achieve for the nation's sake, and respect them more and more. Certain rewards too, are given for long and satisfactory service, the Territorial Decoration being awarded to Officers after 20 years, and the Territorial Efficiency Medal to other ranks after 10 years. Moreover a limited number of Territorial Officers are appointed A. D. C. to H. M. the King.



One night camp of 197th Coast Artillery, N. H. National Guard, on the athletic field of the University of N. H., Durham, N. H., Aug. 6 and 7, 1932.

Are We Weakening? or Simplicity vs. Accuracy

By Major Joseph C. Haw, C.A.C.

WHEN my good friend and former commanding officer, Major W. K. Richards, took pen in hand and wrote "An Estimate of the Anti-aircraft Artillery Situation" for the July-August JOURNAL he must have been very low in spirit. It is a shock to find that a jovial, hale, and hearty Coast Artilleryman has lost all hope for the future and is ready to retreat almost as far back as to the virtually prehistoric Antiaircraft Artillery methods of 1917.

It is with this broad implication of the article in question that we are most concerned, yet it is necessary to begin by discussing in detail certain conclusions reached in that article. So first we will plunge into the details, and if the reader survives them he will eventually find himself in the midst of a broader discussion of policy.

Now for the details. Major Richards advocates that 3-inch guns be pointed by a dual sight system instead of by Case III, and says: "It is thought that the dual sight system can be developed to be simpler, more rugged, more versatile, and more accurate against maneuvering targets than is the Case III system."

In analyzing these claims one must keep in mind the features of the two systems. In both, the data computer, or director, is continuously directed at the target in azimuth and elevation by means of two telescopes or sights; altitude is obtained from the height finder and fed into the computer; the latter continuously, and practically instantaneously, locates the present position of the target, measures its course and speed, predicts its future position, in some types applies various ballistic corrections, and turns out the data on which the gun must be pointed and the fuze set to hit the future position.

There are two Case III methods by which the gun may be set to the azimuth and quadrant elevation determined by the data computer. In the "Follow-the-pointer" system, the data are conveyed by electrical means to azimuth and elevation pointers or needles (like hands of a clock) on the gun which simply indicate the proper settings. Concentric with these needles are other independent needles mechanically geared to the gun in such a manner that they register the actual azimuth and elevation of the piece. The azimuth and elevation setters merely traverse and elevate the piece by handwheels so as to keep the mechanical needles matched with the electrical needles; thus the gun is continuously pointed on the correct instantaneous data.

In the Case III "Torque Amplifier" system, the data computer is by electrical and mechanical devices placed in direct control of the gun so that pointing is automatic, elevation and azimuth setters are eliminated,

and the only men needed at the guns are the loaders and firers.

The "dual sight" system employs two sights on each gun, one for elevation and one for azimuth. The data computer and height finder function exactly as in Case III except that the computer turns out lateral deflection and vertical deflection plus super-elevation instead of future azimuth and future quadrant elevation. Major Richards advocates that the deflections be set on the sights by a "follow-the-pointer" system of self synchronous motors.

In both the Case III and the "dual sight" systems, the fuze is set by man-power using (in modern equipment) a "follow-the-pointer" device.

Now we may begin to analyze and compare. In the first place, if electrical data transmission is to be employed for the dual sights, why introduce extra personnel errors by a "follow-the-pointer" system? A far better way would be to have the sights set automatically by self synchronous motors in a manner similar to the sights that have been developed for the machine gun; that is, a system by which the operation of the data computer sets the sights directly. Indeed, it might well be held that the advantages inherent in such a system constitute practically the only valid arguments in favor of employing sights on individual guns. However, this is beside the point, for it is the contention of the writer that Case III is decidedly preferable to the dual sight system.

Major Richards believes that the "dual sight" system would be simpler and more rugged than Case III. But by introducing electrical data transmission for the sights as advocated by him we would have virtually the same electrical devices as those employed in the Case III system. How, then, is it possible for the former to be simpler and more rugged than the latter?

The proponents of the "dual sight" system advance the theory that individual sights on each gun would be "more versatile" and give "greater accuracy against maneuvering targets", but the reasons for this contention are not stated. In one instance the guns are all directed by the two sights of the data computer which follow every motion of the target, in the other case each gun has its own two sights. In both cases all measurements and computations are performed by the height finder and the data computer, and all arbitrary corrections are determined by one or two officers stationed at a central location and are applied to all guns simultaneously. In these circumstances, it is difficult to see how guns equipped with individual sights can be more versatile, or more accurate against moving targets, than the Case III system.

Now let us see why Case III is not only equal, but definitely superior to the individual gun sights. The article we are discussing does not controvert the claim that the "dual sight" system slows up the rate of fire but states that with it "twenty well aimed shots per gun per minute can be fired * * * * *That is fast enough.*" (Italics, mine) The advantages of high rates of fire are so obvious that few readers will agree with this statement. As long as each shot is well aimed, the greater the volume of fire the greater will be the chances of hitting during any stated period of time. Viewed in this light, the time factor is decisive in Antiaircraft Artillery fire for two reasons; first, because of the desirability of hitting under the easier conditions obtaining before the target starts maneuvering; second, because the target ordinarily passes out of the field of fire in an interval so brief that it is best measured in seconds.

However, the greatest advantage of the Case III system is found in the processes of getting on the target initially and of keeping on it continuously. Most of Major Richards' observation of the "dual sight" system appears to have been in Hawaii where visibility is probably higher than almost anywhere else in the world because of remarkably clear air, bright sunshine, and backgrounds of vivid blue sky or white clouds. In other places it is far more difficult to spot an airplane in flight. Moreover, it is probable that the ranges for target practices in Hawaii in 1927 were considerably short of the ranges at which we must open fire in war. When using sights on individual guns the writer has often seen one or more gun sections unable to locate the target for an appreciable interval after the remainder of the battery and everybody else in the vicinity had picked it up.

But with Case III the data computer and height finder details only must spot the target and the best eyes in the battery can be used for these positions. Thus the time required to open fire with all guns is often considerably less when using Case III.

But picking up the target is one thing and staying on it is another. Individual gun sights are within about two feet or less of the axis of the bore and not more than six or eight feet from the muzzle. The sights and gun pointers are subject to considerable jar and jump at every shot. The flash, smoke, and dust raised by the discharge frequently obscure a target that is perhaps already barely visible because of distance, haze, poor background, or all combined.

Does anyone suppose that gun pointers hold their fire every time they find themselves a few mils off? Hardly; with the battery commander urging speed it is obvious that when guns are pointed by sights a good many shots are undoubtedly fired at moments when the cross hairs are not just where they should be. Again, if the gun pointer does hold his fire until he gets back on target, the round already in the gun is fired with a stale fuze setting. Equipping each gun with two sights would lessen the chances of losing the target altogether but would not materially reduce the probability of the gun being a number of mils off in one of the two directions (lateral or vertical) for any par-

ticular shot. On the other hand, for the reasons already cited it is much easier for the observers on the data computer to keep exactly on target.

In the demonstration cited in the article under discussion, when the Chief of Coast Artillery checked the pointing of a gun, the check gun was evidently not being fired at the time (he could hardly have used during firing a sight which, being fastened to the breech, would have recoiled at each shot). No one will dispute the fact that good gun pointers can track a target accurately as long as their gun is silent. It is the firing that gives them trouble.

With maneuvering targets, especially the data computer detail is much better able to keep on target than are gun pointers, handicapped as the latter are by the jar, flash, smoke, and dust of firing superimposed on the antics of the plane.

A four-gun battery equipped with dual sights would require thirteen men (in addition to the stereoscopic or coincidence observer on the height finder) to be following the target, namely: eight gun pointers, two observers on the director, two on the height finder, and one on the B C telescope. Case III eliminates the eight gun pointers. It is much easier to find in a battery five superior pairs of eyes in the heads of men who possess the other requisites for observers than it is to find thirteen men with the proper physical, mental, and emotional qualifications for observers and gun pointers.

Of course, there are two sides to this question, as to every other one. In the Case III "follow-the-pointer" system, the men on the azimuth and elevation handwheels have difficult jobs because of the jump of the mechanical needles or indicators at every shot. This is a very important defect that has hardly received adequate attention in the past. Despite this defect, however, the Case III "follow-the-pointer" system has been definitely proved to be superior to Case I½ and it is believed that a fair test would show it to be superior to the "dual sights" also.

Furthermore, it is highly probable that the jump of the pointers could be materially reduced; again, the "torque amplifier" Case III apparatus could probably be made more accurate than any "follow-the-pointer" system could ever be made. Thus both types of Case III control as susceptible of improvement, while on the other hand individual gun sights will always suffer from the disadvantages that have been pointed out above.

Moving on to tactics, in "An Estimate of the Anti-aircraft Artillery Situation" it is stated: "In front of the area of Army Depots the enemy air threats will be in practically entirely observation planes, low flying bombers and attack planes in maneuvering flights with the element of surprise always present. * * * * *There will be practically no targets against which the 3-inch gun is effective.*" (Italics, mine) Now the attack planes will certainly be too low for 3-inch guns as a rule, and perhaps the low flying bombers also. However, if in their travels any of these two types happen to ascend above 1000 yards altitude they will be taking a chance if 3-inch guns are present, for these weapons have done good shooting at altitudes down to

1000 yards. As far as observation planes are concerned the question is somewhat different. Our tactical doctrine provides that the Machine Gun Battalions of the Corps Antiaircraft Artillery Regiments, as well as machine guns in the hands of other troops, will be present in the area forward of the Army Depots. If these automatic weapons accomplish their missions they will push the enemy observation planes up to a certain altitude, but it is believed that unless 3-inch guns are present enemy observation ships will not be forced high enough to interfere materially with the execution of observation missions.

As to the difficulties of ammunition supply in the forward area, there will undoubtedly be plenty of trouble on this score. But the troubles to be anticipated in getting up 3-inch ammunition will be met with in supplying 37-mm and caliber .50 ammunition as well.

So much for tactics. Turning to other matters, it is a pleasure to emphasize some of the points made in "An Estimate of the Antiaircraft Artillery Situation" with which the writer finds himself in most enthusiastic accord. First, it is agreed that practically anything would be better than the Case I½ system. Again Antiaircraft Artillery batteries equipped to fire by Case III should decidedly be provided with telephones and individual gun sights as emergency equipment. Then if the "follow-the-pointer" data transmission system or the "torque amplifier" should fail, deflections and fuze ranges could be telephoned and the guns could be fired by the sights with some chance of hitting. Even if the data computer should cease functioning the battery commander could estimate deflections and fuze ranges and fire the battery by the sights. Without a data computer the chance of hitting would be extremely poor; nevertheless, the aviator would probably know he was being shot at and once in a while there would be a hit.

At any rate, sights should certainly be provided for emergency use. It is intolerable that a whole battery should lie silent because of a minor accident to the data transmission system.

Now for the broader principles that are involved in the article under discussion. Major Richards appears to feel that the present types of equipment have reached the limits of their possibilities, and that since we resort to adjustment of fire anyway, we might as well return to simpler fire control methods. These methods would embrace the use of nonballistic data computers for the 3-inch gun and sole dependence upon tracer or explosive bullet control for the 37-mm. and .50 caliber weapons.

The only objections to this line of reasoning are the absolutely vital and basic ones that fire control design for Antiaircraft Artillery weapons is still in its infancy and that simple methods can never exploit to the maximum the inherent capabilities of the firing weapons. The moment we lose sight of these fundamental facts, that moment we confess defeat.

Simplification is a splendid idea. If we can develop a nonballistic data computer that will give us as good results as the best modern computer, let us utilize it—

temporarily only—because of its cheapness and other advantageous features. Again, regardless of other progress, tracer and explosive bullets should be developed to the limit of their technical possibilities and methods of control based on the peculiarities of these projectiles should be exploited to the maximum; they will be invaluable until better methods appear or in case of breakdowns of fire control apparatus.

But all exploitation of so-called "simplified" methods must be subordinated to the search for greater accuracy, and this can be secured, as far as we can foresee, only at the expense of increasingly intricate apparatus. The complexity of the Antiaircraft Artillery problem appears to preclude any easy solution. The fact that present methods fall short of realizing the inherent accuracy of the weapons is the best argument for pushing development until the fire control system is made to be accurate and efficient as the guns themselves are. Only the gloomiest pessimist would claim that we have already exhausted all the possibilities.

We should define the ideal data computer and strive to reach that ideal unless and until it can be definitely proved that the goal is unattainable. We may say that the prediction mechanism of an ideal computer should predict accurately the course of a target changing speed on a three dimension curve provided the target during the time of flight continues on the same curve and continues to change speed at the rate obtaining at the moment of firing. While such a computer may never be invented no one has yet proved that it cannot be invented. At any rate, it should be possible to come a good deal nearer to that ideal than we have as yet.

Even though the ideal may be impossible of attainment, there are many improvements that are undoubtedly possible. For example, so far as known to the writer there is no fire control system that can efficiently cope with a high diving target even if it be following a straight line course. While it is said that one or more types of data computers have attachments to take care of this maneuver, it is not believed that accurate predictions are possible on such courses without a continuous and instantaneous flow of altitudes or slant ranges. Present height finders are hardly adequate for such a task. Again, it may be quite possible to eliminate some of the numerous operators who now crowd around our Antiaircraft Artillery directors, and this step alone would increase the accuracy of these machines.

Another relatively simple defect that can probably be corrected is the jump of the mechanical pointer on guns equipped with Case III "Follow-the-pointer" systems. This matter has already been mentioned.

These are some of the possibilities of improvement that the pessimists are willing to forego. Turning to the automatic weapons, the writer is in thorough agreement that the 37-mm. gun should be designed for "free pointing" for short range work. It cannot pick up and follow targets moving at high angular speed as long as it is operated solely by handwheels of present de-

sign. The same remarks apply to multiple machine gun mounts.

And yet in the automatic weapons also it is highly probable that we can eventually develop a data computer that will give better results at the longer ranges than will tracer or explosive bullet control. At such ranges, Case III ought to be the best pointing method even for automatic weapons, if efficient data computers can be secured.

Now that we are back at Case III, consider the "torque amplifier" system. When it works, this method of Case III pointing is generally admitted to be more accurate than the "follow-the-pointer" system, since it eliminates elevation and azimuth setters on the guns. So far as known, it has not been applied to mobile guns. The power required is small, as "one-man-power" motors would obviously do the work. It is entirely possible that the future may see a new type of purely electrical "torque amplifier" system rugged and reliable enough for mobile guns; certainly every effort should be made to create one.

So it is evident that from every angle the possibilities of improvements in accuracy and efficiency entail greater complexity. But intricate machinery is not necessarily less rugged or less reliable or more difficult to operate than simpler mechanisms. The modern automobile is a highly complex piece of machinery but it is far more sturdy and reliable than were earlier types, and it is also easier to operate.

The question of cost is a different matter, but we cannot give up development merely because we think the final products will be expensive. They may not be as costly as we expect, and it is almost certain that important economies in design and production could be effected once satisfactory models had been produced.

Now it is time to knot the loose ends of this rather rambling discourse. Specifically, it may be said that the "dual sight" system has not been proved to be better than the Case III method of pointing in any respect indeed, there is good reason to believe that the latter is definitely superior to the former.

On the other hand, every gun ought certainly to be provided with sights for emergency use only. It can-

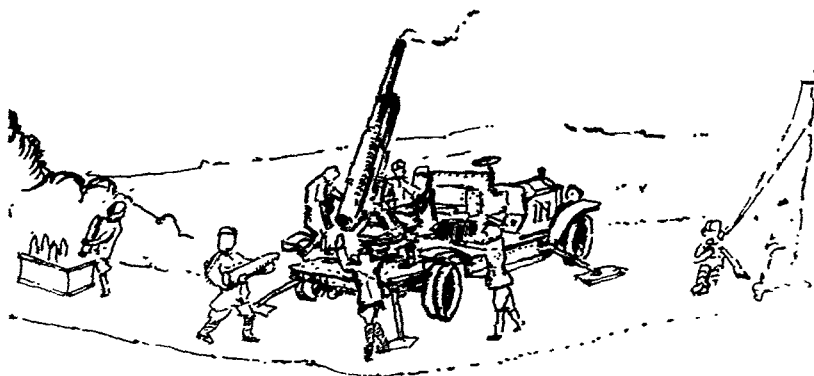
not be too strongly emphasized that no battery should be entirely dependent on a single system. To repeat an earlier statement, it is indeed intolerable that guns should be forced to lie silent because of minor failures in the data transmission system.

With regard to the more basic matter of simplification, the writer believes that any attempt to simplify Antiaircraft Artillery fire control equipment at the price of dropping development along present lines would be suicidal. If simplified computers can do what existing equipment can do, let us adopt them temporarily, by all means, but merely as stop gaps. Let us give the "dual sight" system a fair test, in a battery equipped with the best existing data computer and continuous fuze setters. But by the patron saint of the Artillery, this is certainly not the time to abandon other development work.

Without thinking as far ahead as the ideal, there are many ways in which existing apparatus is probably susceptible of improvement. Certain items, such as reduction of the number of operators for the data computer and reduction of the swing of mechanical elevation and azimuth pointers, have been mentioned. Weak spots in the system neutralize the efficiency of other parts. The entire equipment of a battery must be regarded as a chain no stronger than its weakest link, and there are several weak links whose improvement would enhance the accuracy of fire.

Beyond this, there is reasonable ground for anticipating new inventions, such as better computers, and satisfactory "torque amplifier" systems, that will bring us nearer to the ideal, namely fire control equipment that will exploit the maximum accuracy of which the guns are capable.

The argument for simplification is based on the theory that we will never be able to obtain hits without resorting to adjustment of fire. But once a target starts maneuvering adjustment may only make matters worse. The goal must be equipment so accurate that we can secure hits before the pilot knows that he is under fire. The search for complete fire-control systems of this order of accuracy must continue with increased vigor. There is no easy solution.



Uncle Sam's Warriors of the Campus

By Major William H. Hobson, Infantry (DOL)

UNCLE SAM is a busy man. No one envies him his two-fold job: playing big brother—whether he elects to do so or not—in a wrangling family of nations while trying to keep his own disturbed house in order. Yet, good-naturedly, he tackles each problem with confidence, and is always willing to lend an attentive ear to either side of a national question. For example, the debate over military education. It is hoary with antiquity, yet the argument continues; and the firing grows hotter and hotter.

Just recently Uncle Sam's agents have completed an investigation of the Reserve Officers' Training Corps (R.O.T.C.) system of military education which maintains 324 units in 232 schools and colleges; about 127,000 students are enrolled—85,000 in the senior units in colleges, and the rest (42,500) in junior units in secondary schools.

What new evidence did this investigation reveal? What conclusions did the investigators arrive at? And, more important, in the light of the new evidence, what does Uncle Sam himself think should be done about the R.O.T.C.? Is he willing to continue in his budget the item \$4,000,000 a year, to support this post-war incubator for civilian military leaders?

First, for a word picture of the R.O.T.C. as drawn by its graduates. One is now available in the form of Pamphlet No. 28, U. S. Department of Interior, Office of Education. This pamphlet, entitled "A Study of the Educational Value of Military Instruction in Universities and Colleges," is for sale by the Superintendent of Documents, Washington, D. C., at five cents. Mr. William John Cooper, U. S. Commissioner of Education, the author of an article, "The Question of Military Instruction," in the March, 1932, number of *School Life*, the official organ of the Office of Education, in commenting on pre-war military training, states, in part: ".....This kind of military education proved to be of great service to the Republic in time of danger. Did it have any bearing on getting us into the war? No such charge has been made so far as I can discover. Does it tend to make men eager for actual warfare? It has been asserted by antimilitarists that it does, but I can find no facts to substantiate the charge. In an effort to answer this question, at least in part, the Office of Education is cooperating with a committee in attempting to ascertain from recent graduates who had been enrolled in the Reserve Officers' Training Corps in many of our colleges their frank opinion of the weaknesses and strong points in the military courses which they took and the usefulness, if any, of these courses in civil life....."

In his letter of transmittal with pamphlet No. 28, Mr. Cooper further explains to Doctor Ray Lyman

Wilbur, Secretary of the U. S. Department of Interior, that "..... About 16,000 questionnaires were mailed; more than 10,000 returns were received. All the people who received these blanks were graduates in the period extending from 1920 to 1930. Coming from those who have had experience with the course the returns speak for themselves....."

The introduction to the report on the study explains, in part:

"The educational value of military training has been a matter of debate since the earliest appearance of such training in the college curriculum over a century ago.....

"Thus far there has been relatively little reliable data bearing upon the question, and therefore the discussion has been characterized by bias on both sides...

"It seems also that the opinions of those who have actually undergone a given experience may be assumed to be of more positive value as a basis for conclusions than opinions expressed by those who have not themselves undergone the experience, reactions to which are being studied....."

"The curriculum of the Reserve Officers' Training Corps of the senior division consists of a 4-year course, divided into basic and advanced courses, each of two years' duration.....The basis upon which the course is offered is entirely a matter for institutional decision. At present the course is required of freshmen and sophomores at 80 of the 126 institutions maintaining senior units..... The advanced course is entirely optional and operates on a schedule of five hours per week for both junior and senior years. In addition, the trainees must pledge themselves to attend one 6-week training camp during the summer following completion of their junior year. The aim of the advanced course is to give specialized instruction in that branch of service chosen by the candidate for commission, and to afford practical training in leadership and command.....

"A questionnaire containing 8 principal questions was sent out to.....54 institutions.....

"Every care was taken in formulating the questionnaire to avoid suggesting or influencing the answers...

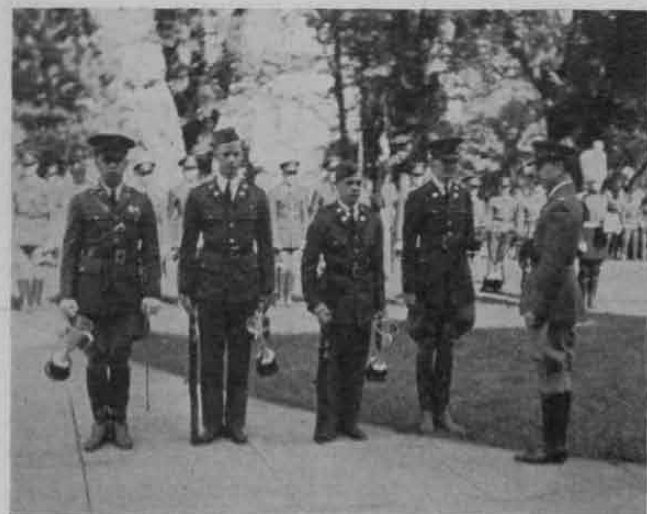
"A wide geographical sampling of institutions was made; 39 states and the District of Columbia were represented.....

"All types of senior.....units were included except the institution organized essentially as a military school."

The pamphlet (No. 28) continues with: a copy of the questionnaire form; a list of the names of the institutions in the study, showing type, basis of training (required or elective), inquiries made, replies received,

and percentage of replies received; a general analysis of the findings, first as a group and, second, according to individual institution; a detailed analysis of opinions expressed by the graduates that could not be tabulated in the simple form of "yes" or "no"; and finally by a brief summary. The summary of the study, complete, reads:

"1. The volume of opinions drawn from more than 10,000 college graduates who completed the R.O.T.C. course in military science and tactics gives full recognition to the educational values derived from the



Colonel E. Goring Bliss, presenting loving cups for highest scholarship to Cadet Capt. Ralph Koebel (Senior class); Cadet Corporal Robert Hall (Sophomore class); Cadet William Collins (Freshmen class); Cadet Sergeant John W. Ahern, (Junior class), Military Day, Georgetown University, 1932.

course. This is apparent from the standpoints of both general education and discipline and educational subject matter. The course is recognized for its utility in developing right habits of mind and body and qualities of character that are fully as useful in everyday experience as they are when applied to military objectives.

"2. The R.O.T.C. is especially recommended by graduates because it has brought to them a more definite and serious recognition of a number of the more important duties and responsibilities of a democratic citizenship.

"3. Graduates of the R.O.T.C. have come to feel that some college authorities and faculties have not given sufficient recognition to the R.O.T.C. as an educational instrument, largely through a failure to perceive many of the educational values that have been developed through its agency.

"4. Although graduates recognize on the whole that military education is equal in quality to that which is academic or professional, they feel that the R.O.T.C. course could be strengthened by better pedagogical training on the part of the teachers of military science, and by their placing greater stress upon the study of principles rather than upon military technique.

"5. The graduates would strongly oppose the abolition of military training from institutions of collegiate grade, and are of the opinion that the contribution made by the R.O.T.C. to a young man's general educa-

tion is sufficient in value to warrant the continuance of the course as a curriculum requirement.

"6. Ninety-three and six-tenths per cent of the 9,636 replies attest that R.O.T.C. training does not create a militaristic attitude in the minds of those who have experienced it, but that it does furnish graduates with a sense of individual responsibility toward national welfare and security."

General Analysis of the Findings

Question ¹	Percent- age an- swering "yes"	Percent- age an- swering "no"	Total re- plies to indi- vidual ques- tions out of the 10,166 replies re- ceived
1	2	3	4
1. In your opinion, has the ROTC military course of study a definite educational value of its own?	97.1	2.9	10,136
2. Did the ROTC contribute anything important or unique to your education?	94.9	5.1	10,084
4. From your own experience was the time spent on the training justified by the results obtained?	94.9	5.1	10,051
7. In your own opinion does the ROTC course of instruction tend to produce a militaristic attitude inimical to world peace?	6.4	93.6	9,636
8. Judging by your own experience:			
(a) Do you favor the ROTC as a required subject for the first two years of college?	81.0	19.0	9,565
(b) Would you make the entire course optional? ..	26.8	73.2	8,989
(c) Would you abolish the ROTC from collegiate institutions?	1.5	98.5	9,203

Question	Percent- age of af- firmative answers	Total replies to individual questions out of the 10,166 replies re- ceived
	5	6
3. How did the quality of the ROTC courses, in respect to content and organization, compare with other courses given at your institution?		
Below average in quality	11.7
Average in quality	68.0	10,099
Above average in quality	20.3
5. In your opinion, did military training aid or make easier the development in your own life of one or more of the qualities or characteristics listed below:		
Leadership	79.1	8,048
Initiative	55.6	5,659
Orderliness	66.5	6,764
Disciplinary value	81.6	8,315
Others most often mentioned in replies		
Confidence, health, patriotism, decision		
6. In what way, if any, has the military education you have received been of economic value to you since graduation?		
In improving physical development	49.3	5,014
In helping to obtain first employment	12.4	1,265

¹ For purpose of clearness, questions calling for "yes" or "no" replies are grouped together.

² There were 576 fewer replies to question 8 (b) than 8 (a), that number evidently considering question 8 (a) as covering the ground.

Note.—Approximately 400 questionnaires were returned with no writing on the back page.

And now we turn to the educators under whose critical eye the R.O.T.C. has been functioning for some thirteen years. What do they say about it? Space will permit here only brief excerpts from typical comments

of some of the 56 presidents of institutions of all types located from coast to coast.

President John Grier Hibben of Princeton University: ".....It does not breed any militaristic spirit among our undergraduates; the discipline, trainingrender very valuable experience to our young men."

President W. Coleman Nevils of Georgetown University: "The R.O.T.C. has received the unqualified approval of both the faculty and student body..... Our military department occupies a position on a par with all other departments of the institution. Believing in the educational value of the training, the university grants appropriate scholastic credits toward a degree for time devoted to military instruction."

President Thomas S. Baker of Carnegie Institute of Technology: ".....It is an element in reasonable preparedness without, it seems to me, the blighting influence of militarism."

President Charles A. Lory of the Colorado State Agricultural College: ".....We find the courses in Military Science, Law, Policy, History and Tactics decidedly helpful, supplementing the work of our other departments in training in patriotism, citizenship, courtesy and leadership."

President Frederick B. Robinson of The College of the City of New York: ".....The influence of the R.O.T.C. is, on the whole, beneficial to the individual, the college and the nation."

President H. W. Foght of the University of Wichita: "I have great faith in the work of the R.O.T.C. as an agency for preparedness without in any sense committing the nation to militarism. I am speaking

as much from my own personal experience in this field, as from a study of the effects of this training upon the members of the R.O.T.C."

President Albert Atkinson of Montana State: "We believe the work offered to be worthwhile and to have real educational value.All other college courses, outside of the courses in military, require primary consideration for individual attainment and development, and we consider the military courses a valuable addition to a well-rounded training."

President Edward C. Elliott of Purdue University: ".....I consider that the R.O.T.C. contributes largely and efficiently to the development of these essential qualities of which dynamic character is composed—the sense of personal responsibility, the spirit of purposeful cooperation, the inspiration of leadership, and a recognition of the eternal place of order and organization in human society....."

President F. D. Farrell of Kansas State Agricultural College: ".....I am sufficiently impressed with the value of an adequately supported and properly directed R.O.T.C. as a part of the work of the Land-Grant Colleges that I should favor it even if we knew there would never be another war."

With such evidence before him, it is easy to imagine Uncle Sam delivering himself of these sentiments in an address to the many groups—pros, cons and neutrals—interested in the timely question of military education:

"The R.O.T.C. should profit by—not suffer from—the controversy over it. I am familiar with the evidence submitted by the debaters on both sides of this question. The opposition maintains that military education is objectionable because: it is unnecessary; it is



VIEW OF A COMPANY IN LINE OF PLATOONS, AT GEORGETOWN, 1932.

out of harmony with the Kellogg Pact; it creates a warlike spirit which tends to bring on rather than prevent war; it is too expensive; harmful methods are being used in colleges to popularize it; the practical results of it in terms of national defense are negligible; the educational advantages—mental, physical and moral—are questionable. Supporting these claims I find: certain religious organizations; so-called 'liberal' groups (varying from communists to 'constructive idealists'); pacifists; internationalists; etc.

"On the other hand I find supporting the present system: educators and student bodies, especially in those institutions maintaining units; R.O.T.C. graduates; patriotic societies; veteran organizations; statesmen and high Government officials; and that part of the general public familiar with the work of the units,

their methods of operation, and the results being attained.

"The opposition, in my opinion, has failed to produce evidence to substantiate their charges.

"My advice to the friends of the R.O.T.C. is that they not become unduly excited over ridicule aimed at our young 'warrior' now in his early teens. He still needs wise guidance in his rearing, if he is to gain his rightful place in our National Defense family, an indispensable member of that larger family we call 'Government.' Let us console ourselves with these thoughts: other loyal intelligent Americans, in the main, are proud, as we are, of the progress our son has made so far; for they, too, see in him a valuable educational factor for maintaining peace at home and abroad; and they seem willing to pay the insignificant price of his upkeep, even in these hard times.



Graduation and a Commission Not Far Off.

Vital Factors in World War

By Ponocrates*

THANKS to modern inventions, such as aircraft, wireless, motor transport, and fast ships, the world is ever becoming smaller. From the point of view of war it is no longer possible to conceive wars of any magnitude taking place almost unobserved in one corner of the world while the rest of the world is unaffected. Distances mean so much less, and nations are economically, financially and even politically so interconnected that a war, on a scale comparable perhaps with the Franco-Prussian War of 1870, could not now take place as it did sixty years ago with near neighbours, such as Great Britain, merely mildly interested. The Great War brought almost all the world into action, and the tendency for a big war to become a world problem is likely to increase year by year. For that very reason, it may be less likely that big wars will take place, but at the same time, with the increase in the scale of conflagration there is an increase in the magnitude of the consequences. It may be well, therefore, just to take stock of the world as a whole, to align some of the big factors in world war, and to note the matters in the existing world that are likely to be important perhaps a generation hence.

Now, whether we belong to the school which believes that armies should be entirely mechanised, or to that which would cling to the organization of the last war, or to one which advocates something between these extremes, all will agree that any large war will be decided by man-power, industry, and raw materials, where raw materials include also food. The need for movement throughout the world introduces as a further vital factor, sea-power.

Man-Power

The following list shows the location of the main populations of the world:—

(From "The Statesman's Year Book," 1929)

Nation	Population In Millions	Annual Increase	Year of Estimate
China	440	Not known	1923
India	319	3,780,000	1921
Russia	147	Not known	1927
U. S. A.	120	1,430,000	1928
British Empire	<div>68 (whites)</div> <div>51 (African natives)</div>	660,000†	1926-28
Japan	64	846,000	1927
Germany	63	402,000	1927
France	<div>41 (whites)</div> <div>56 (natives)</div>	70,000	1926-27
Italy	41	457,000	1927

At first glance, China, India and Russia would appear to be very important. But in each case there is some consideration which removes these nations from

the front rank, as far as man-power is concerned. China is at present disorganized and torn with dissension, and at all times, though described as an entity, will contain races so different in character as to render real unity problematical. The great majority of the people of India come from non-fighting stock. Russia suffers from the effects of vast distances and of the continual struggle against climate. These three peoples are reduced in value from a military point of view on account of their lack of education. To be effective in war, man-power must not only be virile, but it must be highly developed mentally.

The really important Powers from the point of view of man-power are thus the next group, in order of size, the United States, the British Empire, Japan, Germany, France and Italy.

The United States man-power suffers from a lack of homogeneity. In 1921, out of a total of 105 millions, 10½ millions were negroes and 36½ millions were foreigners, only just over half the populations being "100 percent Americans" of Anglo-Saxon origin. While the Anglo-Saxon proportion, for lack of births, decreases steadily, the other proportions, conspicuous for a high birth-rate, tend to mount year by year. In time a cosmopolitan product, with characteristics very different from the original British stock, is certain to be developed. The man-power of this nation, as composed to-day, is to be noted as enjoying a high standard of living, as highly educated and more advanced in the uses of modern inventions than any other. But it is very mixed. Alongside materialism in its worst form, a disregard for law and order and crime statistics which are a national menace are to be found idealism and firm support for religion, peace and charity. This people is unwarlike but has, on the whole, good fighting qualities. It is likely to increase yearly in size by about 1½ millions.

White Man-Power in the British Empire

The white man-power of the British Empire is scattered, with 45½ millions in Great Britain and Northern Ireland, 9½ millions in Canada, and 7½ millions in Australia and New Zealand, as the main components. It is a man-power uniform in its ideals, traditions and history, toughened by wide experience and as generally developed mentally as any in the world. It possesses in Great Britain a source of natural seamen. The white people of the Empire are increasing at a medium rate of about 500,000 a year, while increase due to white immigration is about 150,000 a year. The birth-rate of the whites in the Empire compares reasonably well with that of the United States and Germany, though it is behind that of Japan and Italy. As far as man-power is concerned, apart from any aid from India and the native races of Africa, the British Em-

* From *The Army, Navy and Air Force Gazette* (British). "Ponocrates" is one of the best known pseudonyms in Europe.
† Includes migration to Dominions from countries outside the British Empire.

pire for a generation or two seems likely to keep its place.

Japan

Japan's man-power is increasing at an inordinate rate. Her people are notable fighters, hardy and self-sacrificing. From the point of view of population alone, Japan must be recognized as becoming yearly a more formidable military power.

Germany

Next upon the list comes Germany. Until recent years the virility of the German race was a by-word and her great increase in population is given as a contributory cause of the Great War. The German people are highly educated and, as the last war proved, a military nation in every respect. It is interesting, however, to note that there has been recently an appreciable decline on the annual increase of population. While it was 548,000 in 1925, it fell to 494,000 in 1926, and to 402,000 in 1927—a drop of 27 per cent, in three years. This tendency, if accentuated, may prove important. Meanwhile Germany remains, from the purely man-power aspect, the dominant race in Europe, even though by treaty she is forbidden the military training of her people.

France and Italy

France presents a marked difference. Alone of the larger nations she has no annual increase of white population of any size to her credit. The comparison with her neighbour, Italy, a people of the same present size, shows the state which France has reached. While France in 1927 claimed an excess of white births over deaths of only 70,000, Italy's figure was over six times as great—457,000. The sensitiveness of France as regards communications with the sources of her native man-power can well be appreciated.

Both the people of France and Italy are highly educated; both enforce universal conscription. France has, in addition, a fine military history behind her.

To sum up the man-power situation then, the most formidable mass of intelligent and courageous man-power will be found for many years to come in the United States. The next, the British Empire, is remarkable for being scattered round the globe. The third nation, Japan, like the first, is increasing rapidly in strength and is also a Pacific power. The remainder are all European powers. France, with stationary white man-power, backed by native millions, is sandwiched between Germany and Italy, both of which in a generation look like possessing a great superiority over France in population.

Industry

But man-power alone is not decisive in modern war. Only man-power backed by modern industry can become so. It is necessary to see which nations have both.

The nations possessing large manufacturing industries, in order of the magnitude of those industries, are: The United States, Great Britain, Germany, France, Italy, Japan, in the first rank; those in the second grade being Belgium, Czecho-Slovakia, Poland,

and Canada. It is notable that the six nations of first importance from the point of view of man-power are also the first six from the point of view of war industries. This is partly coincident and partly due to the fact that a large nation will, if it can, for various reasons, make its own manufactures.

But whether these nations have industries adequate to provide all the war stores needed for the full use in the field of their man-power is another question. Certain facts obtainable from the records of the Great War, as far as Britain was concerned, are illuminating.

Firstly, in 1918, when every man possible was being utilized, it appears that about five million were placed in the field and about five million were employed upon munition production. Secondly, with these proportions, the output for ten months in 1918 reached a scale of about 11,000 new gun bodies, 63 million shell, 120,000 machine guns, one million rifles, 22,000 aero-engines and 1,400 tanks. Thirdly, even after the entry of the United States into the war, Great Britain received imports of war stores made in America to help out her industries. Fourthly, at no period were the armies in the field considered to have held enough of every war store. Lastly, time was needed for an industrial nation to get into full war production. The records of 1914-1918 show that years were needed.

The conclusion that can be drawn from these facts, as far as the great nations of the world are concerned, is that probably only the United States has enough man-power to supply fully both the needs of the munition factories and the armies in the field. All the others will have to judge nicely between the needs of the one and the other. Even after years of effort, as seen by the 1918 production, there is a limit to the output of a country in war stores which will limit the size of armies and air forces that can be placed in the field. Unless vast reserves of arms can be laid up in peace (an expensive and dangerous policy in days of continual invention and improvement), a nation, the man-power of which is increasing out of all proportion to the increase in its industries, as perhaps is the case of Japan and Italy today, is not really, from a military point of view, becoming as powerful as might appear.

In the case of all the nations, whatever their man-power and their industries, a long period, perhaps two to three years, depending upon the degree of preparedness of industry, will elapse in war before the nations can even begin to exist at their full power. The value of such forces as exist on the outbreak of war will be out of all proportion to their size.

Raw Materials

In the above consideration of the possibilities of war production by the great nations, it has been assumed that all have adequate supplies of raw materials. Food is the most vital of raw materials and next for war purposes come perhaps, oil, coal, iron, steel, copper, tin, cotton, and rubber.

The condition of the six Great Powers, whose man-power and industries place them in the front rank,

varies considerably as regards these raw materials. The United States possesses ample supplies of all the requisites, except rubber and tin. Further, her supplies are concentrated within her borders. Open sea communications are not a necessity for her existence, though they may be for her prosperity.

The British Empire has all the requirements, though oil only in limited quantities. In her case, however, the main population and industry, in Great Britain, is separated by many miles of ocean from many of her raw material sources, which come from all parts of the world. Open sea-routes are for her essential.

Japan is greatly deficient in many materials. She has no home sources of supply on any scale of coal and iron, oil and rubber. Even in food she requires imports. She also is dependent upon open sea communications, though these, for her, need not be so far flung as in the case of the British Empire.

Germany, as the Great War proved, is largely self-supporting in raw materials. She lacks oil, copper, cotton and rubber and nitrates. With her great chemical industry, however, she has shown a marvelous capacity for evolving substitutes for missing materials. For instance, she has produced oil from coal, and nitrates from the nitrogen in the air.

France is similarly placed to Germany. She possesses much the same resources and lacks the same materials. She has not the same chemical production, but if the sea routes be open she has access to supplies from her colonies.

Italy is far worse off, for not only must she import food for a part of her people, but she is lacking in oil, coal, iron, steel, copper, tin, cotton and rubber; in fact, nearly every important raw material. Without free use of the seas or the establishment of great war stocks Italy will be unable to wage a big war.

Sea-Power

World war presupposes the whole world as the scene of action. A vital factor is the ability to apply force at whatever part of the world seems most advantageous. This ability, whatever the progress of aircraft, can only rest upon sea-power. Also, as we have seen, certain Great Powers—notably the British Empire, Japan, France and Italy—depend upon certain sea communications for their whole war effort.

Sea-power rests mainly upon the strength of fleets and bases. As regards the same six Great Powers, the United States aspires to, and no doubt will, have equality with the greatest other navy in the world, that of the British Empire. But she possesses relatively few overseas bases. The expansion of naval forces in war is as slow a process as that of land and air forces. It is limited by the output in ships and the existence of natural seamen. While in output no doubt American dockyards could play their full part, it is doubtful whether sufficient true seamen for great expansion exist in the United States. No amount of training will turn a landsman into a seafaring man.

The British Empire has still the greatest fleet and has bases in many parts of the world. Great Britain has a great ship-building industry and in her mercantile marine in her people is a reserve of fine seamen. But her sea communications are long and hard to protect except near British bases.

Japan retains a fleet which aims at supremacy in vital home waters. She has shipyards and also a reserve of seafaring population, but no far-flung bases.

Germany has been crippled as a sea-power under the Versailles Treaty.

France and Italy have fleets far smaller than the British and American. Both are placed in a difficult position as regards sea-power, both relatively to each other and to the British Empire. Neither can be said to possess supremacy, except in purely local waters.

Summary

A general summary of the vital factors as applied to the world is interesting. It shows that power is distributed over the six Great Powers, the United States, the British Empire, Germany, France, Japan, and Italy, and that each of these Powers is wanting in something. Thus the United States has insufficient overseas bases and reserves of natural seamen. The British Empire lacks concentration and is consequently sensitive as to sea communications. Germany is not allowed to train armed forces. France is nervous of her white birth rate. Japan needs raw materials. Italy has a serious economic problem, based upon a shortage of fuels and minerals.

It is very apparent from the above summary how important sea-power is. The deficiency of each of the Great Powers could be overcome with sea-power. It could give the United States naval bases and seamen, Britain security of communications, Germany time to train her armed forces, France access to her native man-power, and Japan and Italy their raw materials. The British Empire, as the greatest sea-power, holds for the future the balance of power just as it has done in the past. No Great Power will care to have British sea-power against it, and every Great Power would like to be allied to that sea-power.

As regards the future, as far as can be foreseen, most of the salient points in the world situation are likely to be accentuated. Thus, predominance of the United States, already pronounced in certain directions, is likely to be more pronounced. The dependence of the British Empire upon communications will become greater. The shortage of man-power in France, of raw materials in Japan and Italy, will probably be felt more year by year. The only deficiency in Germany, the lack of armed forces, may become less noticeable if other Powers adopt any measure of disarmament. For the future, then, it is safe to assume that sea-power will be more important than ever. The British Empire will be well advised to maintain its position upon the sea.

The Signal Corps Photographic Laboratory

By Captain James Notestein, Signal Corps (Infantry)

Officer in Charge, Signal Corps Photographic Laboratory, Army War College

"WHEN do we eat?"

Lieutenant A. W. Greely, U. S. Cavalry, engaged on polar exploration in the years 1881-1882, was forced to discard a part of his impedimenta. The choice lay between abandoning a portion of his food supplies, articles of scientific equipment, or his cherished file of polar pictures. Lieutenant Greely's laboriously prepared "wet process" plates were safely returned to the United States. These, he reasoned, will serve posterity.

The problem of how best to preserve valuable historical negatives and make prints therefrom available to scientist, writer and editor faced the War Department in 1894. The Department had just amplified its pictorial records by the acquisition of the "Brady Collection." This file contained approximately 6000 plate negatives. It covered twenty-five years of our national history. Rare portraits of distinguished Americans living in the early years of the 19th Century, prominent figures in the War with Mexico and the only available pictorial record of the Civil War, were etched on these thin glass plates. The problem was solved by the Secretary of War. He placed the negative collections under the supervisory care of "Lieutenant Greely," then Brigadier General A. W. Greely, Chief Signal Officer of the Army.

General Greely established and equipped a Signal Corps Photographic Laboratory at Fort Myer, Virginia. Facilities for negative storage and processing were provided. Prints were made available for research and illustration.

The original collections were greatly augmented by valuable negatives secured from many sources covering the Indian Wars, Spanish-American War, Boxer Rebellion and the Cuban Pacification. After 1900 the files grew apace due to the more or less professional efforts of Signal Corps troops equipped with cameras and assigned to photographic missions in addition to their other duties. Negatives and prints found their way to the War Department files covering training, housing, new developments in ordnance, communications and equipment, army participation in relief of disaster from flood and fire, together with many cabinets filled with official portraits of the officers identified with military activities during this period.

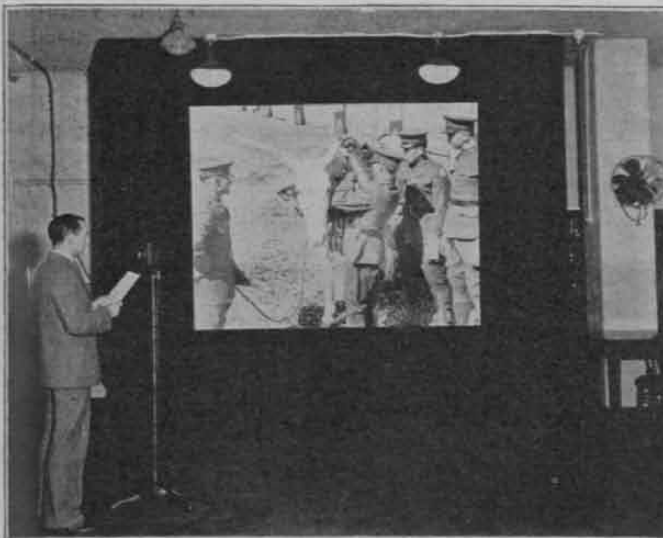
The original laboratory at Fort Myer outgrew available facilities at that station after the Spanish-American War. Its capacity was increased and the plant consolidated with the War Department Library in the State, War and Navy Building.

In 1909 a new photographic problem presented itself. The Wright Brothers demonstrated to the War Department that flight through the air in a heavier than air machine was feasible. Motion pictures of the official tests at Fort Myer were delivered to the Signal Corps for safekeeping. The storage of this negative and that of the Army's first educational picture "Close Order Drill," photographed at the U. S. Military Academy in 1916, was accomplished easily by filing in a single drawer of a filing cabinet, but they presaged a dangerous and important storage problem for the future.



Photo by Signal Corps.

Left: Mr. Brady and his "studio" on a Civil War Location. Inset—Barred and locked files in the laboratory film vault which contain the original Brady negatives. Right: The Signal Corps Photographic Laboratory, Army War College, D. C.



Left: Scoring Sound on a Training Film. Right: Recording Sound Scored in the Studio on a Training Film.

Immediately upon the entry of the United States into the World War, tremendous expansion resulted. Within two years, the expected storage problem was a reality. The Signal Corps was a repository for almost 7,000,000 feet of historical motion picture film and approximately 85,000 still negatives, a pictorial record of the participation of American troops on all fronts. From these files more than 1,000,000 prints of still pictures were required for the Historical Branch of the General Staff and the Committee on Public Information. Several million feet of training film were needed. They were provided. These prints played an important part in the training program for the quickly mobilized Army of the United States. The task of processing, distribution and storage outgrew temporary expedients, especially in view of the fire hazard involved.

In 1919, the Signal Corps occupied a new building and film vault at The Army War College, built to suit its own storage and plant requirements. Years were devoted to indexing, cross-indexing and cataloguing film and motion picture negative so that any scene or still picture might be readily available to soldier or civilian. So great was the interest of the plant employees that practically no loss resulted from filing, indexing and storage. This enviable accomplishment probably resulted from the identification of most of these employees with film and negatives from its initial development, either in the Paris or Washington laboratories.

The value of the pictorial record of the Army is entirely dependent upon its ready accessibility and distribution. Hence, the War Department policy of encouraging the widespread projection of official motion pictures in church, school and the meeting place of patriotic societies, as well as the sale of historical photographs, at a nominal price, to any responsible individual. Coupled with the decentralized loans of training film and certain special military subjects through Corps Area Signal Officers, the Signal Corps Laboratory has distributed approximately 4,-

000 reels of motion picture film and 100,000 still pictures each year. Signal Corps film and prints find their way into every section of the United States and into many foreign countries, thus stimulating new interest in the Army and its activities among those who have no other contact with the military service.

Changes in tactics, technique and equipment, after the World War, served to render obsolete, and obsolescent, many of the sixty-two subjects in the training file. These pictures were produced under the direction of the General Staff, by contract with a commercial motion picture company. In 1928, with the cooperation of the Chiefs of Branches concerned, the laboratory entered the field of educational film production, including direction, editing and processing. Fourteen new subjects, comprising thirty-three reels, have been produced. All were approved by the War Department and distributed to the service. In 1931, funds were made available to the laboratory for the purchase of sound recording and processing equipment. New training films are issued in the 35-mm and 16-mm (home movie) size and in 35-mm sound version. The laboratory has, in addition, formulated a schedule for scoring sound on selected silent films produced since 1928.

With the availability of new subject matter, loans of training film from Corps Area libraries have increased from year to year. The laboratory undertakes to furnish additional prints as required and offers its facilities for the cleaning and repair of serviceable motion picture film from service schools and corps area libraries.

Present equipment and facility in its use contrast markedly with the days of General Greely's issue of cameras to Signal Corps troops in the field, who covered military photographic assignments in addition to their other duties. Within the laboratory is installed the best photographic equipment which the commercial market affords. Trained personnel does complete justice to this equipment. Motion picture photographers from the laboratory go on assignment with

training film units and cover subjects of national interest for the historical files, returning negative which is creditable to the Signal Corps. Developing, printing, titling and animating, when required, are accomplished within the plant so as to furnish a finished product which compares favorably with the better commercial pictures of a similar nature. Still photographers cover local assignments at the White House, in the War Department buildings, on the District Engineer's projects, in short, wherever they are ordered by the Army Pictorial Service. Prints from negatives made on assignments, from the portrait studio, enlarging or contact printing rooms, in general, are superior to those produced commercially. Excellence of equipment and painstaking care in processing, make possible these results.

Each year selected graduates from the Photographic Course at the Signal Corps School are detailed to the laboratory for the additional professional training required to fit them for duty as supervisors or assistant supervisors of corps area or service school photographic laboratories. In this manner, the plant serves to perpetuate a high standard of photographic excellence within its own doors and eventually throughout the service.

Every precaution, within the limit of available funds, is made to safeguard the pictorial record of the army in order that it may "serve posterity". Continuous re-jacketing of still negatives is in progress. About five years, working spare time, is required of the still laboratory personnel to accomplish this project. The entire operation is then repeated. Re-jacketing includes negative inspection to catch chemical decomposition, breakage and filing errors. Vault stocks of motion picture negative are rewound and inspected bi-annually. Rolls showing signs of decom-

position, or the effect of wear, are replaced by duplicate negative fabricated from corresponding files of master print. While no satisfactory solution has been reached by the large experimental laboratories for preserving motion picture film, they are receiving pressure for such a solution, as the age of industry increases. Some process to accomplish such an end, coupled with common-sense vigilance pending such a



The film vault, an adjunct of the laboratory. This vault now contains approximately 5,000,000 feet of War Dept. motion picture films. Inset—Interior of one of the eighteen bank vaults for film storage.

discovery, will make "Flashes of Action" (World War film) available to an audience which will find in it the same interest that the Command and General Staff School would find today in projecting nine reels of "Napoleon's Retreat from Moscow."



The Real Conflict at Shanghai: International Law vs. Tactics

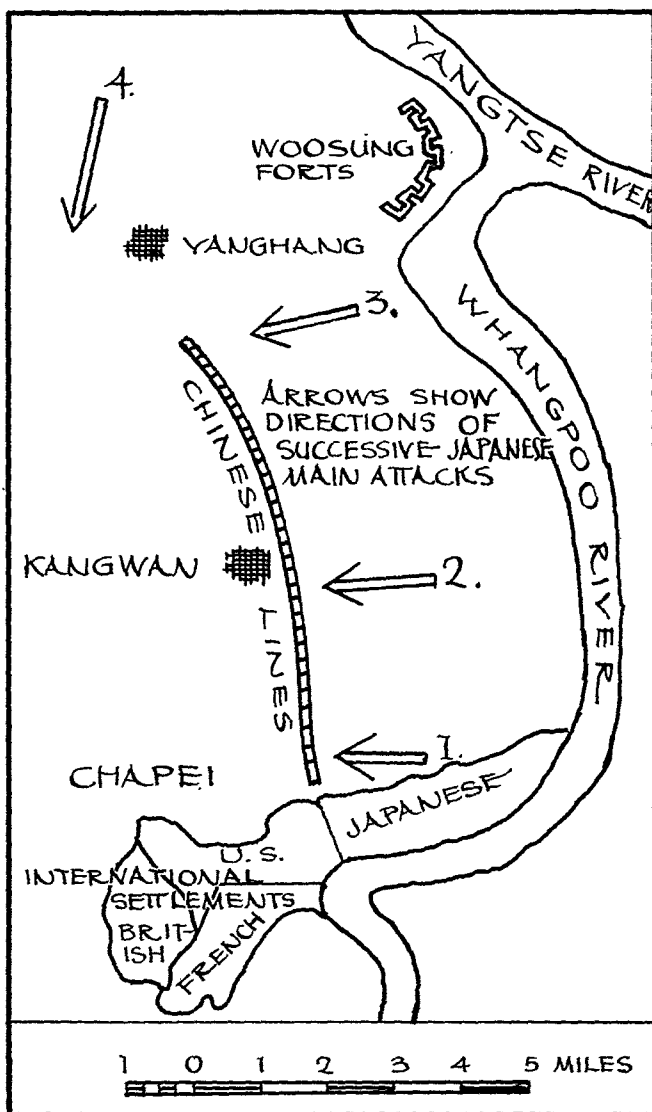
THE latest complete example of a military operation, the Japanese attack at Shanghai, is now on record. Tactically, the lessons were obvious, confirming those principles we at least respect. Tactics are the things one can do in battle: the possible moves of the war game. As with strategy, statesmen can never add to, but may often subtract from these possibilities.

Few cabinets have been better fitted, by training and by doctrine, to prosecute war, and to give a general in the field intelligent, sympathetic backing, than the one which succeeded to power in Japan after the fall of the Shidehara Ministry. But, examining this operation, there appears some evidence that the cabinet, rather than the general, really conducted it.

The right of the Chinese defensive position rested on the International Settlement—neutral ground. But the Chinese left was in the air; it rested on no strong terrain feature, although prolonged and covered to some extent by the detached Woosung forts. In reducing a defensive position, tactics offer but four courses: a straight push, a penetration, a single envelopment or turning movement, and a double envelopment—that maneuver which began as a Punic victory and continued as a Prussian obsession. The Japanese general commanding at Shanghai was a professional soldier, well understanding these elementary theorems of attack. The weakness of the Chinese left was certainly apparent to him at first glance. And he knew that the Japanese naval forces had already failed in a frontal attack in the Chapei area. But instead of adopting the natural and outstanding course; instead of moving troops up the Yangtse River and falling on the flank in rear of the Chinese left, he tried again to penetrate the line near Kangwan Station, and next, to drive in south of the Woosung Forts, toward Yanghang: successive and difficult frontal attacks. In view of General Uyeda's known ability, one can only conclude that he was obeying orders—which none but his home government could impose upon him. But why did a cabinet with considerable military training among its members impose such orders?

Japan had announced that her object was simply to gain Shanghai, not to make war on China. Diplomatically, this statement was so admirable as to be almost an ironical bow toward the United States, which in 1914 seized Vera Cruz without, so President Wilson protested, the slightest hostile intent toward the Mexican people. International law has already acquiesced in the theory that naval forces and marines might land to protect their nationals, and even capture a port in the process, without committing an act of war.

At Vera Cruz, the United States extended this principle by landing army units to hold what the navy had gained. At Shanghai, Japan further extended it by throwing in army units during the fight itself to reinforce the navy, which had not succeeded in gaining anything. The possible attitude of the Western Powers toward this extension naturally caused Japan some anxiety, but she had the dragon



by the tail and could not afford to let go after the Chapei reverse, for, if she evacuated Shanghai before driving out the Chinese, she would have nothing to trade later for a free hand in Manchuria.

But apt as the position may have been diplomatically, it was not so fortunate from a military standpoint. When Japan confined her avowed aims to Shanghai,

she also limited her theater of operations. By introducing army units into the fighting, she had already overstepped the Vera Cruz precedent on which her initial action was based. So to send troops inland up the Yangtse for a far-flung turning movement might, at that delicate stage, have been considered tantamount to invasion and a technical act of war. This was a consummation devoutly to be avoided. Therefore, unless a break with the Western Powers was to be risked, the military maneuver must be curtailed and limited to the immediate area of Shanghai; that is, to direct attacks on the Shanghai position.

Yet even after the check which the naval landing parties had received in the early Chapei fighting, it still seemed probable that the army units would succeed, even in another frontal attack. Armies are intended for land warfare which, to bluejackets, is an avocation at best. The Chinese forces lacked training, discipline, and team work; in all of which the Japanese were superior—so far superior, it was generally conceded at the time, that neither trenches nor numbers could be expected to offset the difference in fighting efficiency.

But the customary unexpected happened. To those of us who were unable to be present at the first battle of Jericho, the similar spectacle, promised us by Mr. Hearst and others in the next war, was not produced. Japanese aviation accomplished no more and no less than our active officers of the Air Corps claim and concede for a battle of entrenched positions. And

the Chinese showed the results of careful foreign training in those two still supreme defensive weapons: burrowed earth and well-placed machine guns. On the morale side, Chapei had given them confidence of success.

When the frontal attacks of the army had also failed the general was superseded, as is usually the case when it is clear that a new plan must be tried and when this change of plan must be made without weakening confidence in the directing authorities at home. The alternatives were to abandon the Shanghai operation entirely or else to try a turning movement up the Yangtse River, even at the risk of Western displeasure. Japan chose the latter. It succeeded tactically. It succeeded diplomatically as well, for the Chinese defense caved in before specific protest could be raised. Before the West knew what was happening or how it was done, Shanghai was in Japanese hands.

Thus, when risked and put to the test, military expediency did not, in this case, jeopardize the diplomatic objectives, but instead actually gained them. Whether or not the hazard to foreign relations was as great as the statesmen believed; and whether or not this hazard, so cautiously played at first, condoned the loss in men and prestige caused by binding General Uyeda's hands, are questions of which an outsider is scarcely competent to judge. But it appears as difficult in war as in peace, for a nation as for an individual, to have a cake and eat it, too.



Field Training of the 61st Coast Artillery (AA)

By Major Evan C. Seaman, 61st C.A. (AA)

A MEMORANDUM from the Office of the Adjutant General, dated April 20, 1932, Subject: "Instruction for Coast Artillery Target Practices, Fiscal Year 1933" prescribes in part that, when consistent with training schedules and available flying hours, Corps Area Commanders will arrange for special joint exercises between Antiaircraft and Air Corps units.

These instructions were carried into effect in the Sixth Corps Area by directing the movement of the 61st C. A. (AA) from Fort Sheridan, Ill., to Scott Field, Ill. there to carry on combined training with the Air Corps troops at that station. The Regiment left Fort Sheridan on September 20th and arrived back at that station exactly four weeks later.

Fifteen officers and about 260 enlisted men made the trip. The motor equipment included five searchlight units, 5 GMC prime movers, 23 Class B trucks, 11 3/4-ton trucks, an ambulance, a White reconnaissance car and a Walters, 2 Colmans and a Reo. The Regiment itself travelled in six sections: five Battery Sections, the searchlight battery being divided into a fast and slow-moving section; and a Repair Section. The first day the Regiment travelled only 63 miles, this because it was necessary to move slowly through the outskirts of Chicago. The last three days, however, movement was at the rate of approximately 100 miles per day. The second night's stop was at Chanute Field, where preliminary arrangements had been made for a gasoline reserve. Scott Field is approximately 360 miles from Fort Sheridan and only 30 miles from St. Louis. The entire trip was made on excellent concrete roads, without serious transportation trouble, it being necessary to tow only one truck into camp during the entire trip.

Upon arrival at Scott Field the Commanding Officer thereat, Colonel John A. Paegelow, and his staff, washing facilities, were constructed; mess tables built,



61st C. A. on the March from Effingham to Scott Field, Ill.

and part of the large balloon hangar cleared and went to unusual efforts to make the Regiment comfortable while uncamped there. Special showers, with turned over for use of the Regiment. The searchlight battery of the Regiment conducted its annual practice in the vicinity of Scott Field. These practices and the drills incident thereto, consumed about eight evenings. Some drill nights were very cold, but as every man who took part was furnished with a woolen flying suit from the Air Corps depot, excellent practices were possible.

On one drill night, when the ceiling was rather low, a Reserve Air Officer was flying over Springfield, 100 miles North of Scott Field. The next day he reported that the illuminated clouds were plainly visible to him.

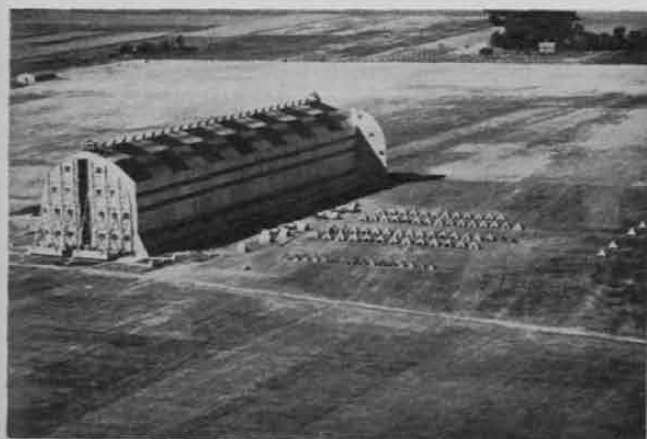
The combined exercises were divided into three phases, as follows:

Phase I—Night attack upon LEBANON with TC 6.

Phase II—Day phase: Gun, MG and SL Btrys in positions. Same to be camouflaged. Observation planes to photograph positions, locations of Btrys to be determined from photographs or from observation planes; attack planes to attack Btry positions with MG fire, followed by small bombing attack. During this period bombardment planes to launch attack upon LEBANON. For this problem LEBANON was considered to represent either a GHQ airdrome or a large Army supply depot.

Phase III—Night phase: Attack upon LEBANON by three or more bombardment planes. Attack upon Gun, MG and SL positions by attack planes. Night attack by bombardment planes with motors silenced.

These problems were followed by critiques, at which the antiaircraft and the Air Corps officers attended



61st C. A. Camp, at Scott Field, Ill.

and where free discussion was encouraged. It was the general consensus of opinion of all the officers that the exercises were of extreme value to both Services and should constitute a part of the annual training program for all Air Corps and Antiaircraft units.

An interesting feature of the trip was an Antiaircraft-Air Corps demonstration in St. Louis. The bat-



61st C. A. Entering Chanute Field, Ill.

teries of the Regiment were installed early in the afternoon in Forest Park. During the evening the 15th Observation Squadron, from Scott Field, and the National Guard Squadron from St. Louis, flew over the Park in groups of three planes, at intervals of approximately 10 minutes. In addition, the dirigible at Scott Field was flown over the Park. The five searchlights of the Regiment picked up and kept the planes and dirigible illuminated. Frequently it was possible to illuminate two groups of planes and the dirigible at the same time. The demonstration was given a great deal of publicity by the newspapers of St. Louis. The night was ideal and it was estimated that 50,000 people visited the sites of the batteries and searchlights during the demonstration. Following are two of the editorials that were published in the St. Louis papers a day or so after the demonstration:

"THE AIR RAID OVER ST. LOUIS

"As a show the night raid of thirty airplanes and a blimp was a thrilling spectacle. From the standpoint of attracting public interest and diminishing future kicks over government appropriations for martial air service the display undoubtedly served its purpose, besides the practice it gave. But there was little to suggest what might have happened if it had been genuine war, with enemy airships less conspicuously painted.

"Searchlight beams can locate aerial marauders, but beams won't bring them down. Bombs dropped from planes or dirigibles would have found a disastrous mark somewhere. No overhead marksmanship could be bad enough to miss the earth. But when it comes to

shooting up to such a height, antiaircraft guns have the entire heavens in which to miss. Every piece of shrapnel fired must come down, as the boys say "on your head or on the ground." The World War record of bombing dirigibles shows a big discrepancy between the total of air raiders found by light beams and the numbers of raiders brought down from below. They might be chased by other air squadrons, but that is something else.

"To the peace-loving layman this Coast Artillery-Air Force carnival suggests above all the need of somebody inventing a poisonous light ray or some deadly vibration of the illuminated ether. Once that is obtained there can be a saving on appropriations for airplane defensive squadrons. The possibilities of defense with such a ray are infinite, until some wicked foreigner gets hold of it."

"A GREAT SHOW, BUT—

"No doubt it was a great show that the Coast Artillery held in Forest Park Wednesday evening, when its synchronized lights and sound detectors located "invading" airplanes in the sky, thus in theory facilitating the task of antiaircraft guns. But from a military standpoint it was not very convincing. Being a show the aviators cooperated with the ground forces, flying agreed courses at stated intervals, so the vast audience could see how the lights work.

"In actual warfare the enemy would not be so obliging and the work of the men in charge of the lights would be immensely more difficult. Moreover, the enemy could handicap or render useless the sound



Demonstrating Searchlight in Forest Park, St. Louis.

detectors by sending swift, low-flying planes, roaring over them. Even if the sound detectors and lights worked perfectly, a moving plane high in the air is one of the most difficult of all targets, and the experience of the war shows that antiaircraft guns have distinct limitations.

"If and when another war occurs some more effective means of guarding large cities against bombing planes will have to be devised than the Coast Artillery's trick."

Basic R.O.T.C. Instruction

By Lieut. Col. P. H. Ottosen, C.A.C.

IN time of peace the training of troops is the most important duty of all officers and noncommissioned officers of the combatant forces. Even in time of war this duty does not cease, and is second in importance only to leading troops in combat. Accordingly every officer and noncommissioned officer should take pride in being known as an efficient instructor from the beginning of his career.

The ink on my commission as captain was not yet dry when I had my first experience in teaching military science to civilians. That was before our entry into the World War. In those days one officer and one soldier was the training cadre for one hundred men under canvas. Not one individual in my company knew how to put on his uniform, make a bed, or aim a rifle. We worked from five o'clock in the morning till four o'clock in the afternoon and then had guard mount and parade. After supper we struggled to keep awake at a lecture by one of the field officers. The scope of our instruction was the same as is now incorporated in the basic course, R. O. T. C., for infantry.

"That Business Men's Camp did wonders for me," said a captain just back from front line service in France. "Didn't have to study so hard on elementary things at training camp; came out a captain; and lots of the routine at the front was about like what you all taught in that Business Men's Camp."

I wonder if this captain of artillery would have won his decorations in battle if it had not been for that *Basic* military training we gave him before he got his *Advanced* course at the First Officers' Training Camp.

In our camps today and in our R. O. T. C. work at the schools we miss an essential element that permeated all our war time training. That element is *interest*. During the World War an intense personal desire to know, burned in the mind of every candidate. Today we must artificially cultivate that quality of mind just as our more successful teachers have always done. Interest is the all important thing. Without it all our instruction is dead.

Practically all colleges and high schools have found that the interest of the student lags unless he attends class at least twice a week in a subject. Furthermore the subject must loom big enough to last half a year at two hours per week or the student discredits it and loses interest. In military science, then, we should combine our courses into large units. The fundamentals of organization, military courtesy, care and cleaning of rifles, and marksmanship should be combined with drill.

Two drills a week should be under cadet officers. There must be cadet officers if we are to develop leaders. They are poor teachers and more than two drills a week under them results in haphazard walking about and inattention in the rear rank with consequent loss of interest by the student.

One drill a week should be under regular army instructors. In this regular army period the fundamentals should be covered in small doses interspersed with the fine points of close order drill. This is good old army recruit instruction. At this drill not more than twenty students should be met at a time. Every officer and every sergeant on R. O. T. C. duty should regularly meet at least one of these groups. It is the most important contact point in the R. O. T. C. Here is the point of greatest interest on the part of the student; the greatest inspiration for the teacher. When the young man gets a rifle all his own, cleans it, handles it, drills with it under the strict eye of a regular army officer or noncommissioned officer, his interest is unbounded. Customs of the service, marksmanship, and the other elements are swallowed without effort. Contrast this with the deadly lectures on organization, courtesy, and such subjects in company or battalion groups by officers who are invariably poor public speakers. It is obvious we ought not to employ a system of cadet officers for all drills, and lectures for imparting all other information.

To students at civilian schools, to their parents who are paying the bills, and to the faculty itself, the military is relatively unimportant. When a young man starts the basic course under these conditions it is imperative that his interest when aroused be supported by giving him important personal qualities that he can explain and demonstrate to a practical and doubting parent or faculty advisor. Posture and carriage must be stressed at drill and the reason explained to the young man. When this is done watch him improve at parade. This reason warrants us in holding parade in the fall before we start teaching manual of arms. In addition to this he must be taught politeness. There is no code of etiquette as simple and elegant as that developed by our army and navy officers. It is truly American in its democratic simplicity. Explain to the young man how he should stand at attention, take off his hat in an office, say "Sir," and show respect to his fellowmen in civil life as well as in military circles. The carriage and manners of the young man will improve in direct proportion to his interest in the basic course. Recruit instruction in the basic course is the key that opens the way to the advanced course of the R. O. T. C.

When recitations are held, a lesson plan must be prepared on a time basis so as to cover the desired assignment. Innumerable questions must be carefully thought out and arranged in the lesson plan. No one is competent to improvise these questions while facing a class. They must not be capable of answer by "Yes" or "No", neither should they be limitless, and sometimes they may be leading questions. Questions from members of the class should be welcomed as they invite interest. The inevitable fool question and those from

inveterate pests should be dealt with according to the personalities involved. Do not rush the questions and answers. Silent moments are valuable; especially those between the propounding of the question and the designation of the cadet who is to recite. It may be the only time when every student is interested in turning the wheels of thought within his head so as not to be caught unawares and seem a dullard before his classmates. All this machinery stops with the designation of a victim. Don't point at a man and call him "You". He resents it. Use his name with a mister before it and he feels a personal interest in the class. A little laugh collects wandering minds because no one wants to miss the point of a joke. These artifices keep classes awake and interested.

The best teachers give extreme care to the comfort of their students. The temperature and freshness of the air should be agreeable. Never let a class face the light which must be bright. Neither should the students have to strain to hear what is said nor have their ears abused by unnecessary loudness. Distractions must be avoided to attain undivided attention. In this particular we are afflicted by the War Department requirement of wearing a uniform in class. The average civilian student's mind associates gunnery with physics more easily if the teacher in each case is similarly dressed. The uniform is a bar between the student and the teacher. Of course the size of the recitation class is from five to twenty members. A lesser number constitutes tutoring and lacks inspiration. A larger number approaches a lecture in its inefficiency. Our public school system is based on learning through the eyes not the ears. If you must lecture write it out carefully following an unforgettable outline. Then burn all your papers, give the boys a good talk along the lines you planned, and don't expect them to remember any more than you do. A good professor once told me that lectures went into one ear of the student and out the other and nothing remained because "there isn't even a filter between." It is not the words you deliver but, what counts, is what the student carries out the door inside his head.

In the Coast Artillery Corps years of successful experience in teaching young civilians to become gunners has led to a course called Gunner's Instruction. It is far superior to any recitation or lecture method of teaching because it has a constant appeal to interest and is practical. A youngster may quickly forget what he has read in a book or heard in a lecture. But it is different with instruments he has had in his hands and manipulated under a tutor. Frequently I have had a student who has dropped military science for a year or two come back to my office and ask about the wind component indicator or atmosphere slide rule. Some problem has come up in his engineering work and he recalls our graphical solution of a similar one. It was the manipulation that fixed our device in his memory. Unfortunately in recent years our Gunner's Instruction has degenerated into a recitation class.

At true Gunner's Instruction an experienced sergeant acts as a tutor to a few recruits. He teaches much more than the silly questions and answers in the

modern pamphlets. Combined with his informal talk is lots of practical operation. The rookie gets all interested in the device under discussion and longs for the time when he can take part in target practice. When I first attempted to apply this method to college students I made several mistakes. My groups around each instrument were too large, five should be the limit; the seniors who instructed were incompetent just as cadet officers are at infantry drill. The best solution is to organize a fire-control (or gun) section with seniors in key positions while recruits complete the drill team including supernumeraries. Seniors, like the old sergeant at Gunner's Instruction, tutor the recruits part of the hour, then every one drills under regular army officers the rest of the hour. After two of these drills the recruits pass to another position but the seniors remain for at least eight drills. During the first drill period the seniors do most of the learning and the recruits less. At the next drill period they break about even. Starting with the third drill period the seniors really put across some good work. Last year I had the seniors lecture their recruits too long and didn't stress the coordinated drill enough. The exact proportion of time to be allotted to the seniors for their talks and demonstrations and the proportion of time utilized for coordinated drill is a matter of judgment based on teaching experience. Returning graduates who were trained this way report that at their reserve officers' camps they were experts in the subjects they taught when they were instructors.

The most important part of our R. O. T. C. work is the Basic Course. It seems inexcusable to have more than one basic course. That should be the infantry. There is only one objective and that is to produce reserve officers. What good is a field artillery officer if he does not know how an infantry rifleman fights? What good is a cavalry officer or coast artillery officer or any staff officer if he does not know the basic infantry elements? Specializing without a sound foundation leads to superficiality and is opposed by real educators. If all high schools in their last two years and all colleges in their first two years teach basic infantry R. O. T. C. work we can assure our countrymen that every reserve officer we later produce has a sound foundation of military science. Only part of those completing the basic course finally emerge from college with reserve commissions. We do not know at high school graduation or in the middle of a college course what specialty the young man may have if he later returns to us in war, but we do know basic infantry training gives qualifications necessary for all officers.

The last two years in high school and first two at college is made up of boys 14 to 21 years old. They seem too young for military service and not mature enough to give indications that they ever will develop into officer material. Let us realize however that what a boy learns in his teens will always be part of him. What he learns later he may forget. Fundamentals must not be capable of being forgotten. Furthermore was not our Civil War fought by boys mostly in their teens? Is it not inspiring to be able to lead and teach such soldiers?

The Foreign Military Press

Reviewed by Major Alexander L. P. Johnson, Infantry

CANADA—*Canadian Defence Quarterly*—July, 1932.
"Intelligence Liaison Between the Army and Air Force," by Sqn. Leader C. M. McEwen, M.C., D.F.C., Royal Canadian Air Force.

The obtaining of information is a duty to which the military commander must give special care. It is the duty of the air force commander to supply information. The military commander is interested in obtaining information on all matters which primarily affect his own immediate plans. Such information will be of value to higher and subordinate commanders, hence there results a constant stream of information passing from one commander to the other, with the bulk of it going from front to rear. In the case of the air force, the author points out, the situation is the reverse. Since the greater portion of information gathered by the air force is of value to the ground forces only, there is less concern with the proper dissemination of the same within the air force. In order to obtain information, the author states, it is necessary that the air force be at all times fully informed as to the intentions of the military commander. Air force personnel must know the general and special situation which confront them so that observers might know what to look for, what it looks like and where to find it, and consequently how to deal with it. Such information must come from the higher echelons beginning with the C-in-C's directive.

The author outlines the organization and functioning of the Intelligence Liaison, touches upon the essential qualifications of the personnel engaged in this important work and, in conclusion, observes that even with good communications and officers possessing the desired attributes there still is need for the closest touch and mutual confidence not only between intelligence officer and pilot, but also between the services.

ECUADOR—*El Ejercito Nacional*—No. 64, 1932.

"Honor, Action, Modesty—Washington," by Alejandro Andrade Coello.

A vibrant, eloquent tribute to the Father of Our Country, who, the author states, possessed the three great attributes which are characteristic of men chosen by destiny for great purposes. "Washington with sublime patriotism and infinite modesty founded a model republic," the author writes. "What he has wrought is immense. It stands in the forefront of nations. If we evaluate human acts by the fruits they bear, then none may obscure the brilliant lustre of the country which owes its mould to the virtuous genius of Washington."

URUGUAY—*Revista Militar y Naval*—July-August, 1931.

"Organization of the General Staff College."

Established at Montevideo, this institution is under the direct control of the Chief of the General Staff.

The faculty, as far as practicable, is composed of senior officers of the army. Duty as a member of the school staff, the faculty or as student officer, counts as duty in command of troops. Student officers are selected by competitive examinations from among captains and majors not more than 38 years of age on the date of admission. They must have had at least two years command duty with troops of their respective arms. The course of instruction comprises two years. The first year is devoted to the study of the infantry division, the second year is given to the cavalry division and the army. In addition, student officers during the second year of their attendance perform tours of duty with the different sections of the general staff and with troops of arms other than their own. The latter periods coincide with the field training period of the army. The curriculum is comprehensive and conforms to the general plan of similar institutions in other countries. It is interesting to note, that tactical problems are first solved on the map, and subsequently on the terrain either as a terrain exercise or tactical walk. As far as practicable the study of each problem involves the solution of all pertinent command and staff considerations and requirements. Each problem affords the student officers a valuable opportunity to carry the "campaign" to a logical conclusion in all its aspects.

AUSTRIA—*Oesterreichische Wehrzeitung*—August 12, 1932.

"Russo-Japanese Relations," by O. W.

Although the war clouds over the Far Eastern horizon lifted for the time being, the danger of war between Japan and Soviet Russia, in the author's opinion, still exists. He believes, China will remain the bone of contention. There are actually three distinct Chinas, the author states. 1. Official China, member of the League of Nations, American protégé, represented by the Nanking government whose authority barely extends over two maritime provinces or less than one-eighth of Chinese territory. 2. Manchurian China with its center at Mukden, although formally independent, owes its present status to Japanese arms. 3. Anarchic China, thoroughly bolshevized, centers largely in the populous middle Yangtse valley.

Japanese conservatism, the author states, is thoroughly opposed to bolshevism, hence the Russo-Japanese difficulties which will inevitably lead to war. The trans-Siberian railway situation has not improved materially since 1904-05, hence the Soviet Government, in the author's opinion, is unlikely to risk war on its own initiative unless the general world situation should be favorable to such an enterprise. It is to be expected, however, that Soviet Russia will seek to embarrass Japan when and wherever possible. Japan, on the other hand, the author thinks, will resolutely ad-

here to her Manchurian policy even though such course might compel the Island Empire to withdraw from the League of Nations. Japanese imperialistic policy in Manchuria, the author states, is opposed by China, the League of Nations and the United States. Intervention by these, even though it might only assume the form of economic pressure, might conceivably encourage Russia to venture a decision by force of arms.

The author states, that according to a diplomat at Geneva, the White House fully expects that Japan will be the first among civilized states to be drawn into a

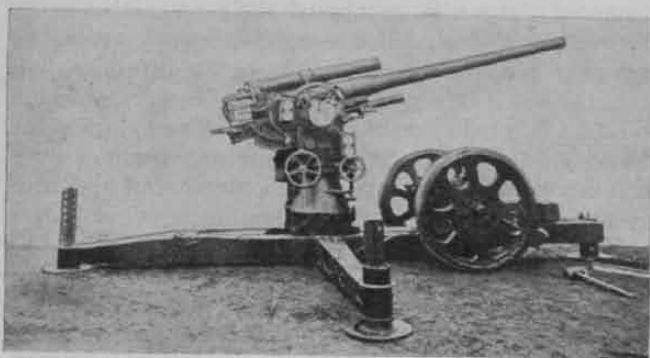


Fig. 1. 80 mm A. A. Cannon in Firing Position Showing the Right Side

conflict with Soviet Russia, and that the impelling force behind such conflict will most likely emanate from Paris. France consistently advocated a crusade against the Soviet. Bolshevism menaces French interests in Indo-China where two years ago serious uprisings occurred. France and Japan have recently concluded an accord relative to the French position in Indo-China. According to rumors, this accord contains secret military clauses. Be that as it may, the author points out, French support of Japan in her recent Shanghai adventure is well known. Japan and France likewise acted in complete accord at the recent Disarmament Conference. The author expresses the belief, that French policy in the Far East is but additional evidence of France's determination to destroy Germany in the interests of her hegemony over Europe. A Russo-Japanese conflict would leave Poland free to deal with Germany without danger to her open eastern frontier.

FRANCE—*La Revue d'Infanterie*—May, 1932.

"Brief Notes on the New Organization of Small Units in the German Army," by Captain de Senneville.

A recent circular of the German Reichswehr Ministry effected important changes in the organization of small units in the German Army in conformity with the German theory of "fire" and "shock." These, in marked contrast to the French concept, the author states, do not merge one into the other. The German idea of differentiation, the author believes, is in some measure the result of the weight of the German light machine gun (17 kg), which prevents its keeping up with the rifleman. In the old organization the light machine gun squad of eight men and one gun con-

stituted the fire unit. The service of the piece required only four men; the others carried rifles equipped with telescopic sights which enabled them to augment the fire power of the light machine gun squad. The shock unit consisted of the rifle squad armed with grenade, automatic pistol and rifle. Each of the three platoons of the infantry company consisted of two light machine gun squads and two or three rifle squads. Fire and movement were regulated by the platoon leader, who employed his squads in conformity with his mission and the situation either as homogeneous or mixed combat groups.

Under the new organization the infantry platoon will consist of three identical and interchangeable groups, each with a leader and assistant leader. The group will contain a light machine gun squad of four men, a rifle squad of 7 to 9 men and 1 runner. The group leader will normally command the light machine gun squad while his assistant takes charge of the riflemen. The new platoon organization will thus have an effective strength of 44 men, 3 light machine guns, 30 rifles and 9 pistols, compared to 42 men, 2 light machine guns, 20 rifles and 6 pistols of the old organization.

The German idea of differentiation of fire and shock action continues and the mechanism of the attack remains unchanged. Combat groups in the attack advance without firing behind the protective barrage of the artillery and the heavy infantry weapons (heavy machine guns, minnenwerfer, infantry cannon). The light machine gun squad forms the spearhead of the attack, the riflemen follow in column of files. Upon reaching assaulting distance, when the supporting fires must of necessity lift, the light machine guns go into action to cover the advance of the rifle squads, which must take advantage of the terrain and the support given by the fire of the light machine guns to drive home the charge.

The new organization simplifies the task of the platoon leader. It becomes his duty to coordinate the manoeuvre and assure the team-work of his three groups. The responsibility for the conduct of the fire and movement now rests upon the shoulders of the group leaders. "It is a grave responsibility," the author observes, "but it may well be entrusted to the remarkably well trained subalterns of a professional army such as the Reichswehr."

Another effect of this reorganization is the substantial increase in the fire power of the infantry. Each rifle company has now 9 light machine guns compared to the former six; or 27 to the battalion and 81 to the regiment. The light machine gun is of a new type, referred to as Model F.M. Unfortunately no particulars are given concerning this weapon. It is noteworthy, however, that each company is equipped with three tripod mounts of great stability. These confer upon the light machine gun the precision of heavy machine guns. On the march, the light machine guns are moved by handcarts. A reserve supply of ammunition is carried in a cart drawn by two horses. Under the new regulation German infantry marches in column of threes like the French.

—*Revue d'Artillerie*—May, 1932.

"The Dutch A.A. Gun, Calibre 80 mm L/50."

The Dutch concern, "Hollandse Industrie en Handelsmaatschappij 'Siderius' N. U.," produced an 80 mm antiaircraft weapon which is said to satisfy all expectations. Mounted on a cross-platform, the gun possesses great stability on any kind of soil irrespective of angle or direction of fire. The pointing devices permit easy and rapid engagement of targets moving at great speed. Firing data are transmitted to the gun electrically from a central fire-control post. In case of interruption of electric power, firing data may be transmitted either by telephone or by direct command to the gun crew.

The breechblock is semi-automatic with an automatic shell ejector. The gun fires normally 20 rounds per minute but may attain a rate of 25 and maintain it from 8 to 10 minutes. The maximum horizontal range is 15 kilometers. The maximum vertical range is 9000 meters with an initial velocity of 750 m/s. The projectile weighs 8 kilograms and contains a powerful high explosive charge. The gun has an all-around horizontal field of fire. Its vertical range extends from minus 3 to plus 80 degrees.

The wheels are rubber-tired and permit transporta-

tion, that centralization of command, which is provided for night firing, is equally applicable to daylight firing. In developing his thesis, the author analyzes and discusses the following propositions:

1. Advantages that may be derived from the concentration of command in the matter of fire.
2. Factors which are responsible for the effective-



Fig. 3. 80 mm A. A. Cannon in Traveling Position

ness of concentration in night firing, and means to improve the results obtained.

3. The possibility of obtaining a concentration in daylight firing by employing with the greatest efficacy methods employed in night firing.

The concentration of the fire of several batteries upon the same target increases the efficacy of the cone of dispersion and correspondingly the vulnerability of the target within that cone without sacrificing the effect of surprise which is essential in A.A. firing. Centralization of command over these batteries permits their proper and advantageous emplacement. It makes for better fire control and facilitates effective use of listening and other mechanical devices.

There are two principal methods employed in A.A. fire, the author states: (1) pre-arranged barrages across the probable lanes of approach, and (2) bursts of fire against airplanes appearing suddenly over any other route. The first of these presents no difficulties whatever. The employment of the method of cotangents to determine the probable route of flight further simplifies this problem. In the second case the use of the method of horizontal intersection becomes necessary which is not very accurate at night. The author discusses this method in detail giving concrete examples of its application.

Inadequacy of antiaircraft equipment, the author states in conclusion, compels a scattering of materiel in order to increase its radius of action. In his opinion, adequate equipment would permit a closer emplacement of guns with a corresponding increase in the overlapping zones. In that event, he believes, concentration of fire will become the rule rather than the exception.

GERMANY—*Militär Wochenblatt*—August 11, 1932.

"Cavalry the Decisive Arm," by "No. 80."

The author discusses the employment of the British Cavalry Corps in the decisive battle in Palestine, September 19-21, 1918. The successes of the Anglo-Egyptian Expeditionary Force in Palestine at the close of

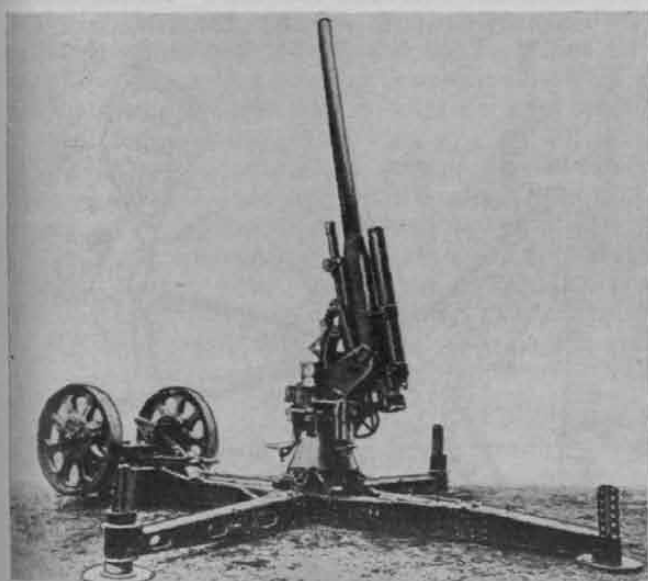


Fig. 2. 80 mm A. A. Cannon in Firing Position showing the Left Side

tion of the gun at a speed of 35 to 40 km per hour. The gun can be placed into action in four minutes. It can fire 1,500 rounds without necessity of replacing the barrel.

—*Revue d'Artillerie*—August, 1932.

"The Problem of Centralization of Command in A.A. Fire," by Art. Sqn. Cmdr. A. Worbe.

Experience of the past number of years in night firing tests against aircraft leads the author to believe that aircraft may be combatted successfully under all circumstances by the simultaneous action of several batteries with the fire properly distributed in the horizontal as well as the vertical plane. He likewise be-

1917 and early in 1918 convinced the British War Council that the elimination of Turkey from the war would bring about the early defeat of the Central Powers. Developments on the Western Front, however, drew heavily upon the British forces in Palestine, and the contemplated action necessarily had to be deferred to the closing days of the war. Nevertheless, this operation contributed materially to Turkey's collapse.

General Allenby had under his command 42 infantry battalions and 37 regiments of cavalry. The plan of his attack, based upon a correct estimate of the enemy situation, was exceptionally bold. The XXI Corps with five divisions and the Desert Mounted Corps were directed to attack the Turkish positions without artillery preparation, advancing behind a rolling barrage to the line: Deir-Sheraf-Samaria-Tul Karm and the Nablus-Jenin railway. As soon as the swamps of the Faliq were taken, the massed cavalry consisting of the Desert Mounted Corps (the 4th and 5th Cavalry Divisions and the 5th Australian Cavalry Division) was to break through the hostile line, cross the Carmel Mountains by two passes, capture and hold El Affule on the second day of its advance and occupy Beisan. The possible capture of the Turkish High Command at Nazareth (General Liman von Sanders Pasha) was also expected.

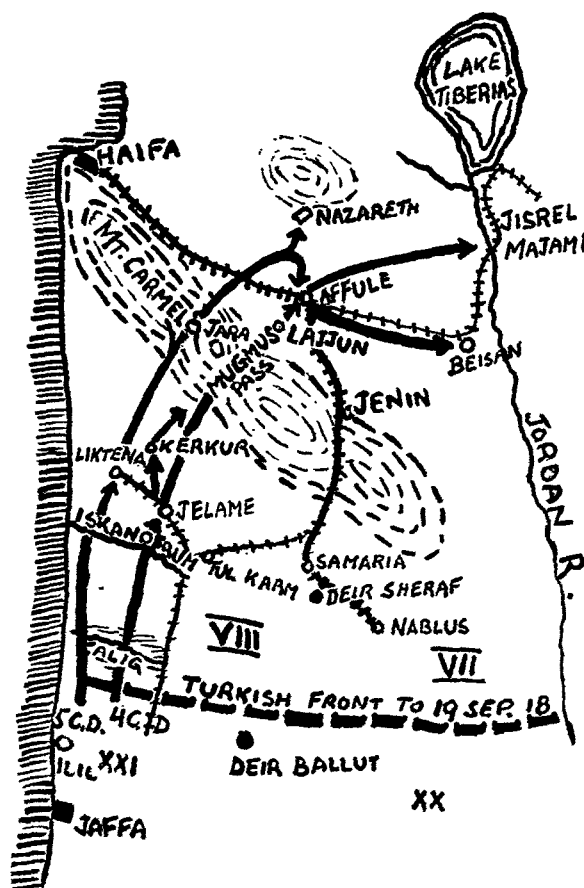
The success of this bold plan, though executed with true cavalry esprit by a comparatively small force, must be attributed to the lamentable state of affairs in the Turkish Army. The Turkish front between the River Jordan and the sea was held by two armies of 12 divisions. These had been, however, reduced to 1,300 rifles each. Turkish battalions mustered 100-180 effectives. The troops were starved and in tatters. Desertions in the Turkish Eighth Army during the last month of the campaign had reached 1,100, or almost the equivalent of a division. Horses, gravely undernourished, could hardly pull a load a distance of 100 yards. Six German battalions presented the only formidable force in front of the British. Although replacements failed to reach them since the preceding spring, the morale of these German troops still remained unimpaired. General Allenby's command numbered 57,000 rifles, 12,000 cavalry and 540 guns. He estimated the Turkish force at 26,000, 3,000 and 370 respectively. These estimates were in excess of the actual strength.

The plan of manoeuvre designated Jelamie as the first objective of the 4th Cavalry Division; thence it was to advance without regard to the progress of the battle in the Tul Karm sector to El Affule via the Musmus Pass, cut the railroad in that vicinity and send a detachment to seize the railroad bridge across the Jordan near Majami. The remainder of the cavalry advancing rapidly had the mission of closing the high-ways from Nablus and the Jordan valley—the 5th Cavalry Division in readiness at 5 a. m.; first objective Liktena, thence advancing rapidly paralleling the route of the 4th Cavalry Division across Carmel to El Affule, leaving a security detachment at Jara to cover approaches from Haifa. From El Affule the

5th Cavalry Division was to send a contingent to Nazareth to effect the capture of important personages and documents, the remainder remaining in readiness for action against Jenin and Beisan—the 5th Australian Cavalry Division, in reserve, prepared to march upon orders on Jenin.

The British infantry jumped off at 4:30 a. m., September 19, and reached its first objective, the northern bank of the Faliq, without difficulty. The 5th Cavalry Division was the first to move out. The advance guard regiment covered the 9.5 km to the mouth of the Faliq at a trot. Continuing the advance, it brushed aside easily the feeble resistance offered by the Turks from time to time. The division covered the distance of 15.3 km to the Iskandrūn in 2 hours, 15 minutes including the time taken up by skirmishes. The remainder of the distance to Liktena (7 km) the division covered in 45 minutes. The pace was so rapid that the brigade commander, riding at a gallop, was unable to stop the head of the column. As a consequence, the advance guard regiment was thoroughly tired by the time it had covered one-third of the total distance to its ultimate objective.

The 4th Cavalry Division passed through the infantry at 8:40 a. m. Advancing echeloned to the right, the division encountered no resistance. Turkish troops were taken by complete surprise. By 4.30 p. m. the



division had reached its objective, having covered a distance of 30 km in seven hours. The Australian Cavalry Division advanced to the Iskandrūn. At 8 a. m. all communications between Turkish G.H.Q. and

the two field armies were completely severed by the British occupation of Tul Karm. Between 10 and 11 a. m. Turkish G.H.Q. received information from the Seventh Army concerning the advance of British cavalry. General Liman von Sanders notified Haifa and dispatched six companies with 12 heavy machine guns under German command to block Musmus Pass. News of the collapse of the Eighth Army did not reach Turkish G.H.Q. for several days.

The 5th Cavalry Division resumed the march from Liktena at 6:15 p. m. leaving one brigade less one regiment at Liktena in charge of the baggage. The command reached the Mt. Carmel divide at 1 a. m., September 20, after having left two troops at Jara for flank protection against Haifa. The march over the narrow trails was made in column of troopers. The 13th brigade in lead reached Nazareth at 4:30 a. m. Entering the town with drawn sabres at a gallop, the troopers were stopped within 200 meters of the quarters occupied by General Liman von Sanders. The 14th Brigade being unable to support the attack, the column was ordered to fall back upon El Affule which it reached at 7:15 a. m. The 4th Cavalry Division arrived half an hour later having accomplished its mission without encountering serious opposition.

The Cavalry Corps, on September 21, held Beisan and Jisr el Majami with the 4th Division, and Jenin-Affule-Nazareth with the 5th and the Australian Cavalry Divisions, with a covering detachment near Haifa. On the same day, the British infantry divisions reached the line Nablus-Samaria-Tul Karm.

The Desert Mounted Corps carried, in addition to the ration for September 18, three rations on the saddle and a fourth ration in the rear echelon.

The operation resulted in the annihilation of the Turkish Eighth Army, the capture of 25,000 prisoners, the entire artillery and baggage. The remnants of the Eighth and the Seventh Armies, finding their line of retreat towards the coast as well as towards the north cut off, were compelled to hack their way through British Cavalry and hostile Arabs, and retired across the mountainous country northeastward.

—*Deutsche Wehr*—June 24, 1932.

"The Motorized Brigade," by Colonel M. von Wietorin, Austrian Army.

Prevailing military opinion generally agrees upon the fact, the author states, that both horse and motor will, for some time to come, remain indispensable. With that in view the author endeavors to determine where and to what extent the motor may displace the horse. Staffs, auxiliary arms and rear area installations being tied to the roads will no doubt prefer the motor to the horse. Combat troops, on the other hand, especially under artillery fire, operate over terrain at a distance from highways. There, the author believes, the horse continues superior even to the tractor. It is, important, he holds, that the strategic mobility and speed of the motor and the tactical mobility of the horse be exploited to the limit. This concept, the author states, is responsible for the plan of light and mixed divisions. A few experiments, however, clearly

demonstrated the great difficulty involved in the proper coordination and cooperation at the critical moment of two so vastly different elements as the motor and the horse. The next step in the solution of the problem logically consisted of the separation of the motorized and mounted troops, and their employment in accordance with the situation, mission and nature of the terrain. The employment of large bodies of motorized troops presupposes suitable terrain with a good and ample road net, a well-developed motor industry and provision of adequate supplies of motor fuel either by means of peace-time accumulation and storage, or by means of developing a suitable fuel substitute.

The paramount advantage of the motor is its capacity for high speed and its great strategic mobility. Excessive optimism is, however, likely to prove disappointing. The necessity of moving by bounds, unexpected road obstructions and obstacles may considerably slow up the progress of a large motor column. The actual average speed is not in excess of 20 kilometers per hour for daylight travel and only 15 kilometers per hour at night. Although the daily total mileage for a motor column is likewise far below what might be expected, it still is considerably in excess of that of an infantry or cavalry division. Another advantage of the motor is that it does not require any fuel while at rest, and it certainly is not subject to fatigue to the same extent as man or beast. Nevertheless, regular rest periods are necessary not only for the personnel serving the motors, but also for overhaul and repairs.

An outstanding disadvantage of the motor is its decreased mobility in cross-country travel. This disadvantage may be overcome to some extent, the author believes, by adapting at least combat vehicles for cross-country travel. For this purpose, he believes, artillery should be provided with tractors and handcarts. Another serious disadvantage of motor columns is their great length, vulnerability and the complicated march-technique involved in their movement. Strict march discipline is essential. Special protective measures against aerial and flank attacks while enroute must also be provided. Dust clouds, the noise of the motors, and at night, headlights disclose truck movements and to that extent prevent secrecy. This, of course, is likewise a serious disadvantage.

The author believes, that the employment of motorized units will not be unlike that of large cavalry commands. Owing to their great mobility, they are, in his opinion, particularly suited as G.H.Q. reserves. French experiments, the author states, showed that the motorized infantry division is too unwieldy. English tests with motorized brigades proved more practicable. Actually the brigade in these tests was merely a reinforced regiment with the necessary transportation, supply equipment and installations. In the author's opinion, motors within a single command should be of uniform type and capacity of performance. There must be an adequate supply of motorcycles with and without sidecars. The command must be well equipped with heavy machine guns and anti-tank weapons. Pioneer units are likewise indispensable.

—*Deutsche Wehr*—February 12, 1932.

"The Basic Causes of the Manchurian Conflict," by Lieut. E. Golling.

When Japanese artillery, on September 18, 1931, from positions within the Japanese concession, opened fire upon the Chinese arsenal at Mukden, the Manchurian question suddenly became a matter of world interest. Twice the size of Germany, Manchuria is the ancient homeland of China's last imperial dynasty. Rich in natural resources and blessed with fertile soil, Manchuria is indeed a worthy prize. As the focal point of the clashing interests of China, Japan and Russia, Manchuria is, in the author's opinion, a potential powder barrel which only requires the spark to set the world ablaze. While in 1905 there were approximately 5-6 millions of Chinese domiciled within this province, there are now, the author states, more than 30 millions. In addition to these, the Manchurian population includes some 800,000 Koreans, and about 200,000 Japanese.

Manchuria is served by the following principal railways:

1. The Mukden-Peking railway, along the narrow coastal strip. Constructed with British capital, this railroad is Chinese owned, and serves as the only connecting link between Manchuria and China. It is an economic artery of great strategic importance.

2. The South Manchurian Railway serves as the connecting link between the Russian sphere of influence in the north and the Japanese in the south. Considered the vital artery of Manchuria, this railroad with all its branches is Japanese property.

3. The Chinese Eastern Railways, part of the Russian trans-Siberian system, are under joint Chinese-Russian administration.

Since Great Britain opened China's doors to the Western World in 1842, the Celestial Kingdom had to submit to numerous humiliations. Disastrous foreign wars and internecine strife, as well as devastating floods and famines contributed materially to China's weakness. Nothing is more natural than the desire of imperialistic world powers to acquire a slice of this vast territory held by an enfeebled and militarily impotent nation. In recent years, however, China gave indications of growing strength. By means of economic weapons China began to recover her freedom of action. Japan, which sends 27% of her exports to China, suffered particularly from the effect of these periodic trade boycotts. China's effort to construct additional railways in order to make herself independent of the Japanese lines, also the Chinese tariff policy and growing Chinese nationalism contributed their share to the growing tension between China and Japan. The arrest and execution as a spy of an officer of the Imperial Japanese General Staff by Chinese troops in Manchuria incensed Japanese public opinion. Leaflets dropped by military aviators in Tokio demanded war on China. Reports of the destruction of a railroad bridge in Manchuria by Chinese troops finally prompted General Honjo, Japanese commander in Korea, to take drastic action. He promptly occupied Mukden and with action the military party

once more set the pace for a "positive" foreign policy.

Three factors determine the foreign policy of Japan:

1. Territorial expansion to accommodate the growing population which increases at a rate of 900,000 per year.

2. Creation of markets for Japanese industries.

3. Acquisition of sources of raw materials which will render Japan independent of foreign countries and which would be capable of sustaining Japan in case of war.

A powerful navy is a prime necessity for the attainment of these objectives.

Manchuria has been virtually a Japanese possession since the Russo-Japanese war. Chinese sovereignty was at the best nominal. Japanese investments in Manchuria are in excess of a billion dollars. Japan has built schools, hospitals and factories. She maintains in Manchuria 22 consulates, 387 police stations and an army of 18,000 men. Her nationals enjoy extra-territorial rights. A strip of land, 15 kilometers wide along the right of way of the South Manchurian Railway is completely under Japanese jurisdiction and is policed by six railway guard battalions.

Japan's strategic interests in Manchuria are no less important. Manchuria is Japan's concentration area for military operations in the event of war with Russia. Possession of that province also confers upon Japan great possibilities of influence in Chinese affairs. Thus, for political, military and economic reasons the possession of Manchuria is indispensable to Japan, and she is prepared to risk her national existence for it. "We must risk war even though Soviet Russia and the United States should align themselves on the side of China," is the significant comment of a Japanese newspaper. Japanese activities in Manchuria, concludes the author, indicate long and careful preparation. In his opinion, Japan has merely awaited a favorable opportunity.

GREAT BRITAIN—*The Cavalry Journal*,—April, 1932.

"The Rurales of Mexico," by Perry Cross Standing.

The guerilla warfare which ravaged Mexico during the middle sixties produced numerous outlaw bands that considerably outlived the civil war which brought them into being. After his second election to the Presidency, General Porfirio Diaz caused the arrest of the leaders of some of the most notorious bands that ravaged the countryside. He then hit upon the expedient of giving them their choice of being shot or taking service under him as captains of a rural police, pledging themselves to assist in ridding the country of the robber organizations. It was the beginning of the famous Rurales, corresponding in both authority and discipline to the Mounted Police of Canada.

The Rurales were mounted upon small, hardy, spirited horses of Mexican breed. They were equipped with sabre and carbine. They were carefully recruited, well trained and dependable. As a reserve of the National Army of Mexico they were under the control of the Ministry of War although their pay came from the Ministry of the Interior.

The new constitution promulgated on February 5, 1917, converted Mexico into a federal republic which left the right of managing local affairs to the individual states. As a consequence, the corps of Rurales was disbanded and ceased to exist as an armed organized contingent of Mexico's public service.

—*Journal of the Royal United Service Institution*
—February, 1932.

"Aerial Bombardment and International Law," by Philip Landon, M.A., M.C.

From a strategical as well as tactical point of view the most important innovation of the World War was the development of the air arm as a means of reconnaissance and as an engine of attack by means of bombardment. International Law is little concerned with the first of these. The post-war development, however, made it clear that in any future war the question would immediately arise as to the extent to which a belligerent may make use of his aircraft for the purpose of bombarding populous centers in hostile territory. Eight jurists expressed an opinion on this subject in a book entitled "*La Protection des Populations Civiles contre les Bombardements*," published by the International Red Cross Association at Geneva. These experts are agreed, however, upon one point only, namely, that it is impossible to apply to the modern technique of air bombardment the principles which under the Hague Conventions were designed to regulate the use of artillery on land and at sea. One of these experts, Dr. Royse, an American, holds "there are no conventional rules in actual force which directly affect aerial bombardment.... Civil populations can lawfully be subjected to bombardment.... upon the basis of military objective." Sir George Macdonough of Great Britain, the Dutch Professor Van Eysinga and the German Professor Simons agree with this view. On the other hand, the consensus of opinion among the other experts whose views are expressed in this volume is to the effect that while it is impossible to forbid the use of that arm altogether, it is capable of regulation with a view of affording the greatest possible protection to civil populations.

Professor Sibert of Rennes, expressing the French point of view, holds that the term "military objective" should include "any thing or any person that in fact contributes to the preparation or execution of hostile acts of destruction." Under this definition bombardment designed merely to terrorize inhabitants, or to destroy the economic life of an enemy people would become unlawful. It would not spare private property, such as a factory, because the bulk of its products are innocent. Neither would it spare human life, for nowadays "workers participate in every war." While military considerations make it impossible to require prior notification, or to restrict bombardments to daylight hours, Professor Sibert holds, that "military objective" implies some particular locality and, therefore, the bombardment lawfully spreads its effect beyond the actual limits of such locality. For this reason, he contends, the use of any form of incendiary or lethal bomb should be prohibited.

—*Journal of the Royal United Service Institution*
—May, 1932.

"Anti-Aircraft Gunnery," I. By a Pilot; II. By a Gunner.

Two very interesting discussions of the effectiveness of antiaircraft artillery fire from opposite points of view. Admitting that there has been a great improvement in the technique and accuracy of antiaircraft firing since the war, the pilot-author holds, that aircraft improved even more, and with due care taken by the pilot to make small, continuous but irregular changes in course and altitude, the chances of hitting the aircraft are less today than they were during the late war. He, therefore, believes, that the air force must adhere to the doctrine it teaches, that pilots must do their work thoroughly and well in the face of antiaircraft fire. In his opinion, antiaircraft fire may discourage aircraft loitering in defended zones, but will not act as a serious deterrent, while parachutes should serve to make the pilot's morale in the face of antiaircraft fire firmer than it was during the World War.

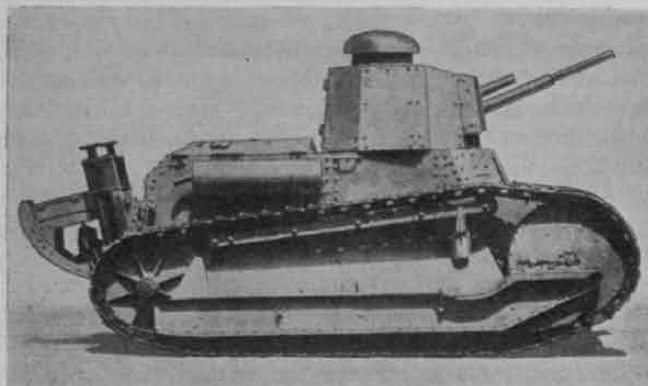
The pilot-author regards the fire of fixed antiaircraft defenses more effective than that of mobile field equipment or the antiaircraft armament of men-of-war. In any event, the factor of time, in his opinion, favors the aircraft. Thus a plane travelling at 150 m.p.h. at 10,000 feet elevation will cover four-fifths of a mile during the time of flight of an antiaircraft projectile. The gun must be so laid, and the fuse so set that the shell will burst within 15 yards of the plane. An alteration of five degrees in the course at the moment the gun is fired will cause the gunner to miss his target by about 120 yards.

Small arms fire from the ground is effective only against low-flying aircraft. This, however, is to a large extent offset by the enormous asset of surprise possessed by the airplane leaping at a marching column flying at 180 m.p.h. or 264 feet per second at an elevation of 150 feet, dropping bombs and firing machine guns. In twenty seconds the attack is over before the rifleman or machine gunner had a fair chance to get into action. A ship suffers from three serious handicaps that make against effective antiaircraft fire: 1. The unexpected movement of roll and that caused by the blast of the main armament while allowance must also be made for the ship's course and speed. 2. Mast, rigging, aials and general top-hamper tend to limit the arc of fire of antiaircraft guns. 3. The threat of surface or submarine attack is likely to distract attention from the air.

The pilot-author holds, that the air-defences cannot erect a barrier which the attacking aircraft cannot cross, nor can all raiders be shot down by antiaircraft fire and fighter aircraft. In his opinion, the only way to stop air attack completely is to bring about a collapse of the morale of the personnel engaged in it. This can result only from a very high rate of casualties among fliers.

The gunner-author, in support of his side of the argument, points out that in 1917 the British antiaircraft artillery required an average of 8000 rounds

to destroy a single aircraft. Early in 1918 this figure dropped to 4,550 rounds and by the end of that year it was as low as 1,500 rounds. In August, 1930, a 75 mm. mobile antiaircraft equipment perfected by Vickers-Armstrong firing H.E. shells by the indirect method at sleeve targets towed at a speed of 120 m.p.h. at an altitude of 7000 feet brought down the first target by the 21st round and the second by the ninth round. The third target was not brought down but examination after thirty rounds showed six holes. The



Fiat Tank—Type 3000 B

gun was controlled by the Vickers A.A. Predictor with electrical transmission gear.

The same equipment was used in a firing test on the Belgian coast. There were in all five series fired. In the first series, a sleeve target at 100 m.p.h. at 2000 meters altitude and a horizontal range of 3000 meters produced 54 effective bursts out of seventy. Series 2, a sleeve target towed at 100 m.p.h. at 3000 meters altitude resulted in 23 effective bursts out of fifty-seven. In Series 3, against a Fairey Fighter aircraft flying at 188 m.p.h. at an altitude of 1500 meters and minimum horizontal range of 5000 meters, the gun being laid 180 degrees off the target, seven bursts out of 24 observed proved effective. Series 4, similar to series 3, but a still and hazy atmosphere which made observation difficult, the plane flying at an altitude of 3000 meters, 23 bursts were effective in forty-seven. These four series were fired by employees of Vickers-Armstrong some of whom were only partially trained. In Series 5 Belgian troops untrained in the use of the Vickers Predictor operated this equipment. The gun was served by its British detachment. The sky was overcast and low clouds obscured the target except at low altitudes. The sleeve target, moving at a high angular velocity, presented an unusually difficult target. It was towed at a height of 450 meters at a minimum horizontal range of 2300 meters. Seventeen rounds were fired, of which only ten could be observed and all of these proved effective.

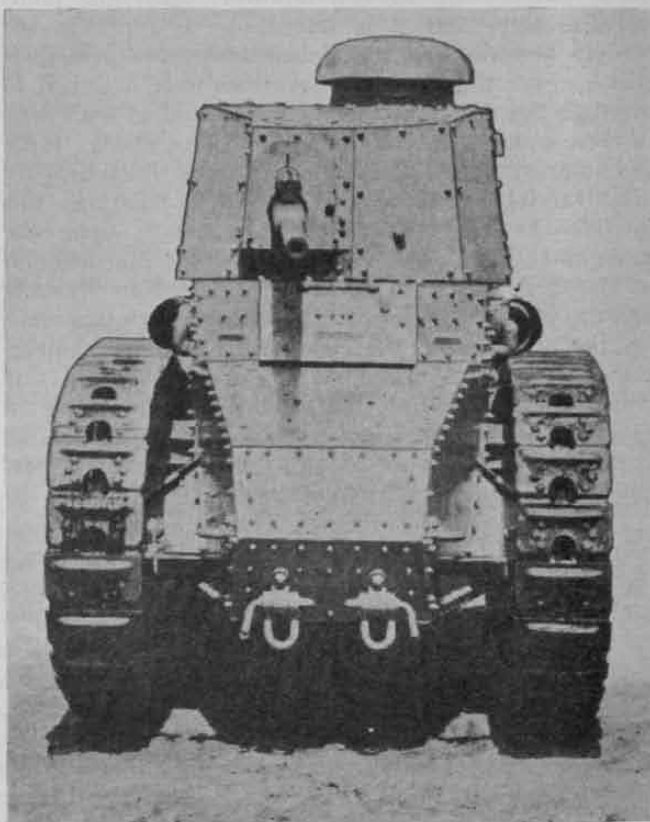
The equipment used in these tests consists of a gun, mounting and firing platform on a separate axle. Both gun and limber, which is optional for horse transport, are mounted on springs, the wheels being provided with rubber tires. The equipment can travel at 22 m.p.h. The elevation, training and fuse receivers on the gun are connected electrically with the Vickers Predictor. A mechanical fuse-setter is also provided.

The gun can be brought from battery into firing position and vice-versa in two minutes. The detachment consists of gunner and nine men. The 46 cal. gun has a muzzle velocity of 2641 f/secs giving a maximum horizontal range of 16,000 yards and a maximum vertical range of 32,150 feet. A two-gun section manned by a fully trained crew can fire six rounds in five seconds. The Predictor is complete in itself with the exception of the height finder. It is operated by five men for direct fire and six men for indirect fire. Operators of this instrument can easily learn their duties. The only electrical gear in the apparatus is the transmission gear for communicating, in case of indirect fire, the quadrant elevation, direction and fuse to the guns by means of the "follow-the-pointer" system. The effectiveness of this equipment, its ease and rapidity of operation convinces the gunner-author, that air-bombing is destined to become one of the most hazardous undertakings to which aircraft may be assigned.

—*The Royal Tank Corps Journal*—May, 1932.

"Fiat Tank—Type 3000B," by O. H. Hacker.

The result of some years of experimentation, the new Fiat Tank, Type 3000B is the successor of Type 3000. Externally the two types bear close resemblance,



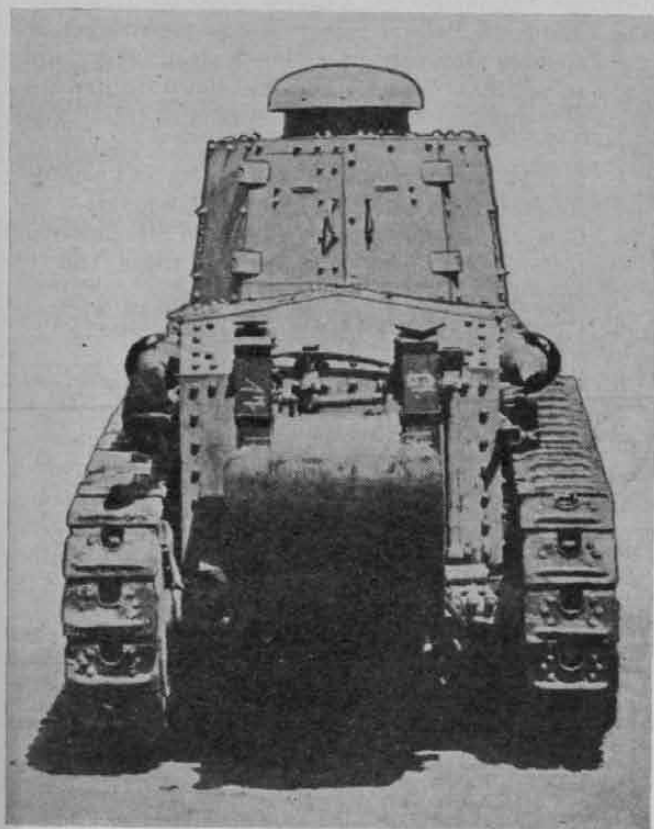
Fiat Tank, Type 3000 B
Front View

the mechanical details of the new, however, have been modernized.

The power plant is a four-cylinder motor with a bore of 105 mm and a stroke of 180 mm giving a capacity of 6.235 litres and an output of 63 h.p. at 1500 r.p.m. The crank case is of aluminum. Lubri-

cation by force-feed gear pumps. A very efficient fan blows the air from the crew compartment through an exceptionally large radiator. The motor is provided with a centrifugal water pump and vacuum feed system.

The transmission system consists of a reinforced multi-disc clutch and a newly designed three-speed



Fiat Tank, Type 3000 B
Rear View

gear box. The speeds are: the high gear: 9.85 m.p.h.; the intermediate: 4.1 m.p.h.; the low gear: 1.8 m.p.h.; and reverse: 1.5 m.p.h. The two large brakes, adjustable from the outside, are wider than those of the old model. They are operated by foot pedals and hand levers. The interior consists of two compartments, one for the engine, the other for the crew. The latter also contains the steering and operating levers and the armament mounted in a revolving turret. The tank is supported by two frames fitted on well sprung improved rollers with chains that cannot slip off.

The tank can cross water to a depth of 0.9 meters. A spur at the rear end increases stability in crossing ditches, uneven ground and dikes. The watertight shell is constructed of vanadium steel plates of a thickness of 16 mm wherever exposed to direct fire and elsewhere from 6 to 8 mm. The improved design for lookouts prevents the penetration of bullets or shell splinters. The crew consists of two men. Armament either a 37 mm gun or a pair of machine guns.

—*Army, Navy and Air Force Gazette*—August 11, 1932. "Officers' Pay."

There has been considerable dissatisfaction among officers of the British military and naval services, the

author states, with the system of emoluments which varied automatically with changes in the index figure of the cost of living. The resulting pay cuts had an irritating effect upon those concerned, moreover, there has never been any real confidence in the fairness of the system of arriving at the cost of living figures. This system bore no resemblance to the charges officers had to face for mess expenses, uniform, travelling, education and the like. Naturally enough, a change in the pay system has been constantly advocated by the services. The British Government finally decided to stabilize the pay of officers. This decision does not involve a change in the pay rates. It merely averts a threatened pay reduction and guarantees present rates until 1934. The present rate of pay corresponds to a cost of living figure of about 49. Should, during the period of stabilization, the index figure drop below 35 or rise above 60 and continue at such level for six months, the resultant situation will be subject to review.

HUNGARY—*Magyar Katonai Szemle*—July, 1932.

"Troop Leading of a Reinforced Battalion in Action," by Lieut. Col. Vitéz Béla Pekle.

The author believes that the principal role of the battalion commander in action consists of a proper and uninterrupted coordination of fire power and shock action throughout the combat. In order to carry out his functions, the battalion commander must depend upon his means of communication. The telephone, telegraph and runners provide the most dependable means of communication. Unfortunately, the author observes, peace-time manoeuvres in this respect bear no resemblance to the actualities of war. In manoeuvres the communications net functions without break. Runners go about their errands under conditions which in actual war would result in their speedy annihilation. Although umpires should restrict these activities to simulate battle conditions, they are actually reluctant to do so for fear of interfering with the proper progress of the exercise. This, the author thinks, is a mistake for it produces a delusion, and in time the impossible will become an acquired habit.

The author believes that the proper solution is offered by the radio. Portable sets can readily be put into operation anywhere. Orders given by radio would be promptly executed, hence the enemy would have little time to benefit from the information thus conveyed to him. Hostile interference may easily be overcome by frequent changes of wave lengths according to a prearranged schedule. For effective service, the author believes, the battalion would require about 8-10 portable radio sets.

Leading guns and machine guns under the battalion commander's control may be used effectively to shift or to concentrate supporting fires upon certain targets at critical moments. For this purpose a special type tracer ammunition, which produces a colored smoke upon striking the designated target, will, in the author's opinion, prove most useful. Since movement depends upon the effectiveness of the fire, the battalion commander can, in such manner, indicate to his riflemen when and where they may push the attack and make further progress.

The lion's share of responsibility in troop leading, the author states, rests upon the battalion commander. Aptitude, efficiency and force are essential prerequisites for sure and determined troop leading, but without the proper and uninterrupted functioning of communications and the auxiliary means placed at the battalion commander's disposal, failure will be inevitable.

INDIA—*The Journal of the United Service Institution of India*—April, 1932.

"Manchuria—The Background of the Present Eastern Crisis," by Major B. R. Mullaly, 10th Gurkha Rifles.

Manchuria, with an area of about 360,000 square miles extending a little over 1000 miles from north to south and about 800 miles at its greatest width from east to west, is, in the greater part a vast plain, skirted by the Khingan Mountains in the northwest and the Chanpoi Range in the southeast. The climate is severe, the cold in winter intense. The soil of the great central plain is fertile. The soya bean constitutes the main crop, the export of which, in 1929, amounted to nearly 300 million taels in value. Outside of large towns metalled roads are unknown. In winter the frozen rivers are extensively used as highways. The main arteries of communication are the railways. There are three main systems: (1) the Chinese owned Peking-Mukden Railway; (2) the Japanese owned South Manchurian Railway with the Antung-Mukden line; and (3) the Russian owned Chinese Eastern system, the link in the trans-Siberian railroad with its southern branch from Harbin to Changchun. The last of these systems is a 5-foot gauge railway, the others are 4 feet, 8½ inches. The break in gauge is at Changchun.

The rapidly expanding population of Manchuria is now estimated at about 29 millions of whom about one million are Koreans, 150,000 Russians and 200,000 Japanese. Constant civil wars and conditions prevailing in many parts of China during the past number of years have been responsible for the extensive immigration of Chinese into this vast territory.

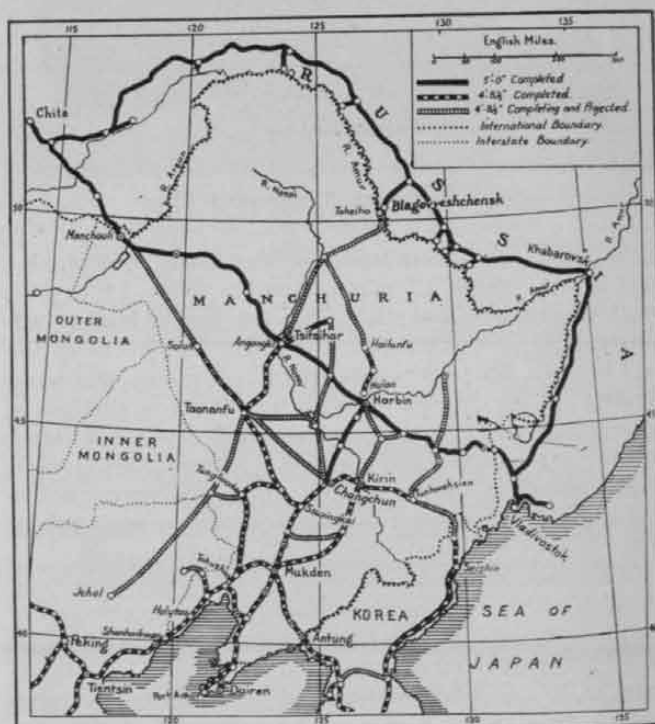
The author divides Manchurian history into five periods: (1) the early period, ending with the Sino-Japanese war of 1894-95; (2) the period of Russian expansion ending with the Russo-Japanese War of 1904-05; (3) the period of Japanese expansion checked by the Washington conference; (4) the period of Chinese competition with Japanese interests; and (5) the present, when the destiny of Manchuria is once more being reshaped. The author outlines briefly the outstanding developments of each of these historic periods. He goes into detail in discussing the Chinese program of railroad construction in Manchuria in open competition with and defiance of Japanese interests. As a counterpart of these activities, the Chinese were holding up deliberately construction on lines for which loans had been obtained from Japan, and the completion of which China had undertaken in various treaty agreements. At the outbreak of the present difficulties Japan claimed that there were more than

300 cases of infringement of Japanese rights. The principal matters in dispute aside from the railways involved questions affecting the right of residence; right of lease; rights of commercial and industrial enterprises; illegal taxation; extra-territorial rights; administrative rights in the South Manchurian Railway zone; jurisdiction over Korean subjects whose Japanese nationality the Chinese consistently ignored. The League of Nations intervened in the dispute, but the Japanese Government adhered steadfastly to the right to negotiate directly and laid down a number of basic principles on which it is prepared to treat. These are:

1. Mutual cessation of aggressive policy and conduct;
2. Respect for Chinese territorial integrity;
3. Complete suppression of organized movements interfering with the freedom of trade and the stirring up of international hatred;
4. Protection of legitimate activities of Japanese subjects;
5. Respect for Japanese treaty rights in Manchuria.

China regards the treaties concluded by former governments acting under duress as "unequal treaties" and as such, she believes, they ought to be revoked. China refuses to treat with Japan until all Japanese troops have been withdrawn from the Railway Zone.

The Japanese attitude in Manchuria, the author states, is easily understandable. Manchuria under the domination of another power would menace the exist-



ence of Japan. She has sacrificed heavily to secure the right to a special position in that country. She has invested enormous amounts of money. The problem of Japan's growing population is likewise acute. A solution is also sought to the problem of further industrialization, and in this connection Manchuria, as a source of raw materials, assumes particular im-

portance. It is close, reasonably safe against attack, and at the same time provides a good market for Japan's finished products. Last but not least, Japan regards Manchuria as her first line of defense against the Red Armies and Bolshevism.

—*The Journal of the United Service Institution of India*—July, 1932.

"The Philippines and the Pacific Problem," by Captain M. E. S. Laws, M.C.

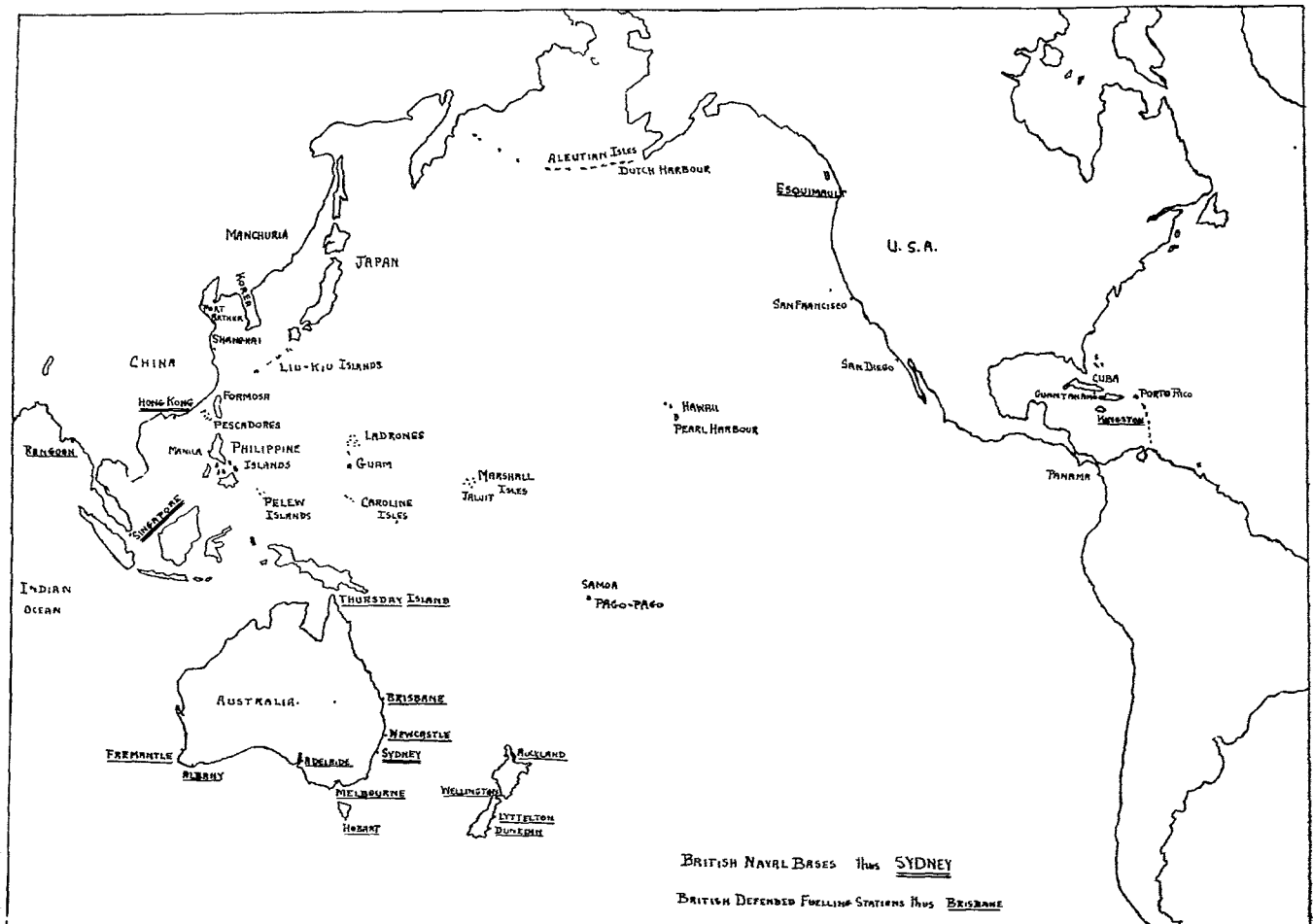
Outlining briefly the historical background of the American occupation of the Philippine Islands, the author discusses the probable effect upon the Pacific problem of Philippine Independence as provided by a bill recently passed by the United States House of Representatives.

The author points out, that the opening of the Panama Canal soon followed American occupation of the Philippines and Guam, and that the Canal Zone was heavily fortified contrary to the terms of the Hay-Pauncefote treaty. In order to protect American lines of communications, the United States established a series of naval bases in the Pacific. Among these, Dutch Harbor, in the Aleutians, flanks the approaches to San Francisco from Japan. Pearl Harbor is conveniently located for the defense of the Canal.

Even before American acquisition of the Philippines, Japan annexed Formosa and the Pescadores Islands. Subsequently she acquired Korea and Port

Arthur. The Japanese naval base in the Pescadores is 500 miles from Manila. This, and the Japanese naval bases of Formosa and Japan proper constitute a serious menace to the long line of communication between the Pacific Coast, Hawaii, Guam and the Philippines. The acquisition by Japan at the conclusion of the World War of the Marshall, the Caroline, the Pelew and Ladrone Islands definitely established the Island Empire athwart the direct route between Pearl Harbor and Manila. Submarines and modern aircraft based on these islands would make it a very dangerous enterprise for the American fleet to operate in the Western Pacific. The possession of these islands enables Japan to prevent troop movements between the United States and the Philippines.

In the author's opinion, the situation appeared so dangerous, that in 1921 a conference of powers was held in Washington, which finally produced the Five Power treaty limiting naval establishments and putting a stop to further fortifications in the Pacific by the United States and Japan. The general situation, however, the author thinks, still remained favorable to Japan. He believes, that economic factors further aggravated the difficult situation of the United States. The growth of the Japanese population and the development of her industries compel Japan to seek an outlet for both and this necessity actuates Japan's foreign policy. American immigration laws, the author points out, closed the doors to Japanese settlers,



Australia and New Zealand adopted a similar immigration policy. This attitude naturally led Japan to safeguard her position in the Pacific, and she has succeeded in securing control of all approaches to China by sea.

British interests, according to the author, demand retention of control of the approaches to the Indian Ocean and to keep open sea communications to Australia and New Zealand. Although British trade interests in China are considerable, in the author's opinion, no vital trade route of the British Empire crosses the Northern Pacific. British interests, he points out, center chiefly in the Western Pacific. Hongkong, the British tradecenter in China, cannot accommodate capital ships. Under the Five Power Pact the defenses of Hongkong cannot be increased, Singapore is, therefore, now being developed as a naval and air force base. It is well adapted for the use of a naval force charged with the mission of defending the eastern entrances to the Indian Ocean.

The author believes, that the granting of independence to the Philippines will benefit the United States. It will obviate the necessity of maintaining a garrison in an isolated position far from support. It will abolish preferential treatment of Philippine products and thus redound to the economic advantage of the United States. On the other hand, however, the author believes, that the evacuation of the Philippines will adversely affect American prestige in the Orient, particularly in China. The surrender of an American naval base in the China Sea will, of course be cause for rejoicing in Japan. It will remove a possible menace to her trade, and it will also tend to open the way for Japanese immigration southward. Her island possessions will then stretch to the equator and bar the westward routes of the United States.

The new policy, the author thinks, is perhaps not so favorable to the British Empire. Australia and New Zealand naturally regard with suspicion the removal of an obstacle from Japan's path towards the south. In the author's opinion, a strict and effective neutrality of the Philippines will best serve the interests of the British Empire, and he believes, that in the future such a doctrine will form an essential part of British policy in the Pacific.

GREAT BRITAIN—*Journal Royal United Service Institution*—November, 1932.

“Coast Defence Reorganization.”

(1) As a result of the investigations made in recent years into the problem of Coast Defence in Great Britain, the Secretary of State for War in his Memo-

randum on the Army Estimates for 1932 stated last February that it had been decided to entrust to the Territorial Army the entire responsibility for manning these coast defences, and to reorganize the Territorial Army units so as to bring them into proper relation with the existing seafront armament and lights, and to provide new units necessary for antiaircraft protection.

(2) A meeting of representatives of the War Office, the Commands and the Territorial Army Associations was held on April 6th to discuss the draft scheme which had been prepared.

Since that meeting, Commands and Territorial Army Associations concerned have had the opportunity to examine and comment on the War Office proposals. As a result the scheme in detail, as finally approved, has now been issued to all concerned.

(3) The main features of the scheme are as follows—

(i) It provides for the reorganization of existing Territorial Army Coast Defence units and their allotment to defended ports, in order to bring those units into proper relation to the requirements if sea-front armament and lights;

(ii) It provides the necessary antiaircraft units, either by the conversion of existing coast defence units not required for the sea-front defences, or in certain cases, by the conversion of field and medium artillery batteries which, owing to their proximity to the ports concerned, are suitably placed for immediate manning duties in war

(iii) It makes certain adjustments in those artillery brigades which are affected by this conversion.

(4) Men up to fifty years of age may be enlisted in coast defence units for Home Service only provided that the number of such men does not exceed 33½ per cent. of the establishment of units.

(5) All ranks commissioned, enlisted, or re-engaged in future, both in sea-front and antiaircraft units, will be required to sign an agreement undertaking to come up for service as and when required, even though the Territorial Army has not been embodied.

(6) The new establishments published with the scheme will come into force on October 1, 1932, and units will have completed their reorganization by March 31, 1933.

(7) The normal titles of the new units have not yet been finally decided.

NATIONAL GUARD NOTES

The National Guard Convention

THE outstanding event of the season in National Guard circles was the annual convention of the National Guard Association at Norfolk, Virginia, over the period October 20-22, 1932.

More than three hundred delegates from 34 states attended and participated in the sessions on the floor of the assembly.

The National Guard of Virginia under the direction of General S. Gardner Waller, the Adjutant General of the State, were the hosts of the affair, the details of which were assigned to Colonel William H. Sands and his corps of officers of the 111th Field Artillery, Virginia National Guard, with headquarters in Norfolk. The whole affair was systematically organized under the tactful hand of Colonel Sands and every desire of the Association authorities and the delegates was forthcoming. Convention Headquarters was at the Monticello Hotel, whose management cooperated in every way possible to afford the accommodations which were necessary or desired.

On the day previous to the opening of the convention the Adjutant General's Association held their regular semi-annual assembly which was presided over by Brigadier General Ralph M. Immell, Wisconsin National Guard, who is president of the association. Other sessions were held from time to time during the continuance of the convention, during which problems confronting the National Guard and the methods of cooperation with the National Guard Association were discussed and acted upon.

Brigadier General Robert J. Travis, Georgia National Guard, President of the Association, presided at the sessions. He was ably assisted by Brigadier General Claude V. Birkhead, Texas National Guard and Vice-president; Brigadier General Fred M. Waterbury, New York National Guard, Secretary; and Brigadier General Milton R. McLean, Kansas National Guard, Treasurer.

Among the speakers who addressed the assembly were Brigadier General S. Gardner Waller, Adjutant General of Virginia, who spoke for Governor Pollard; Honorable Charles D. Poland, who represented the Mayor of Norfolk; Brigadier General Claude V. Birkhead, Texas National Guard, who responded to the addresses of welcome to the Old Dominion; Major General George E. Leach, Chief of the Militia Bureau; Major General Paul B. Malone, Commanding General of the Third Corps Area; Colonel L. Kemper Williams, President of the Reserve Officers' Association; Honorable Frederick H. Payne, Assistant Secretary of War; and Brigadier General Andrew Moses, Assistant Chief of Staff G-1.

One of the high lights of the convention was the splendid address of Major General George E. Leach, Chief of the Militia Bureau, in the course of which he discussed the affairs of the National Guard in detail and gave the delegates a practical and comprehensive picture of the situation as it exists at the present time. He discussed the Militia Bureau Budget for 1933 and explained the expedients which have been resorted to in balancing that budget in order to provide funds for carrying out the field training projects and conducting the full 48 armory drills provided for by law. In all of this process these two vital activities of the National Guard have not been curtailed to the slightest degree. Every organization has or will have its full 15 days field training and every unit its full 48 armory drills. In this process of budget balancing a number of projects had to be cut to the bone. It was necessary to take large sums from funds intended for the purchase of airplanes and ammunition. Animal caretakers contributed some \$400,000 to the cause and the item of inspection and purchase of ordnance materiel made up substantial sums. In order that some of the funds may be restored to the projects from which they were taken to balance the budget, the Association passed a resolution directing the Executive Council to propose to the Congress the passage of a deficiency measure in the approximate sum of \$2,200,000 to partially cover the deficit in field training and armory drill pay. Even with this additional amount the Militia Bureau will show a saving of close to a million and a half dollars for the fiscal year.

General Leach explained how the National Guard construction program got lost in the shuffle when the Emergency Relief Bill was passed in June. He voiced the opinion that in view of the economic situation, it will be an opportune time to go to Congress with a construction program early in the forthcoming session. He presented such a program for the consideration of the National Guard Association. It contemplates expenditures running to more than four million dollars. It covers construction work at National Guard camps which is essential or desirable for the training of the troops. This construction, which will eventually be done, will give employment to workers on the job and be devoted to the purchase of material which will provide orders for the builders' supply industry in the ratio of 75% and 25% respectively. The work is spread over the whole country like a blanket. It takes in camps in 47 states and Hawaii. The Association passed a resolution directing the Executive Council to prepare a Bill for presentation to Congress to cover the project of National Guard camp construc-

tion, in accordance with the plan proposed by the Chief of the Militia Bureau, and it may be expected that such a Bill will find its way before Congress at the forthcoming session.

General Leach explained in detail the procedure involved in arriving at the decision to reduce the number of animal caretakers in the National Guard. This was done by requiring these caretakers to care for 16 animals instead of the eight that they formerly took care of. The funds were allotted to states this year on a money basis instead of a personnel basis and the funds for materiel caretakers was added in such way that the whole may be lumped together and employed for the purpose intended in accordance with the particular situation confronting state authorities. In a resolution the Association indicated that the National Guard would cooperate to the fullest extent compatible with the maintenance of the efficiency of its units, in producing economy in national expenditures, but voiced the opinion that the savings effected in the animal caretaker project were too drastic and recommended that the sum of \$170,000 be restored to the project this year, if and when funds are made available through a deficiency appropriation.

General Leach also discussed the medical treatment of National Guardsmen who are injured or taken sick at the summer training camps. The costs of this treatment has been going up steadily since the time it was provided for in the law of 1928, until this year it is estimated that the total will reach the neighborhood of \$70,000. There is a wide variation in the several states. Where the matter is given careful supervision, the costs are much lower. In several states the men are subjected to a complete physical examination when they come to camp and all found with chronic cases of appendicitis, hernia and other disabilities which might be aggravated by camp activities and result in costly operations and treatment are forthwith sent back home. The costs of treatment here is materially reduced. The Association passed a resolution directing the Executive Council to confer with the Chief of the Militia Bureau relative to the enunciation of a policy which will adjust the matter of medical treatment of National Guardsmen at training camps with fairness to them and to the Government.

The proposition of the curtailment of State Staffs was presented to the Association and a resolution was passed referring the matter to the Executive Council with a direction that it be studied and a report submitted to the Association at its convention next year.

The Militia Bureau Budget provides \$480,000 a year for the expenses of the 505 sergeant-instructors on duty with the National Guard. This covers their commutation of quarters and subsistence and their minor medical treatment. The General acknowledged the service these men have rendered to the National Guard in the past, but voiced the opinion that now that the National Guard had processed a large number of officers and noncommissioned officers through the service schools, that it was no longer necessary to have so many of them. He further indicated that the total number should be reduced to the point where there will be one sergeant-instructor per regiment or separ-

ate organization in the National Guard. This would provide for about one half the number now on duty with the National Guard. The reduction is to be effected by not filling vacancies due to retirement and other causes. Promotions are to be made normally in the D.E.M.L. and the vacancies are to be taken up in grade four by not filling the vacancies as they occur. The Association passed a resolution on this subject, which is quoted in full here:

RESOLUTION No. 6.

Reduction in Number of Sergeant-Instructors.

BE IT RESOLVED by the National Guard Association of the United States in Convention assembled in the City of Norfolk, Va., on October 21, 1932, that it recommend to the Chief of the Militia Bureau the adoption of a policy whereby the number of sergeant-instructors now on duty with the National Guard be reduced over a period of years until the allotment shall consist of one (1) sergeant-instructor per regiment or separate organization:

PROVIDED, That nothing in this policy shall operate to bar promotions of sergeant-instructors of the 1st, 2nd and 3rd grades now on duty with the National Guard, and that all vacancies occurring in accordance with this policy shall occur in the 4th grade.

General Leach then explained his future hopes with respect to the progress of the National Guard. These included a motor equipment program costing some \$5,000,000 over a period of years which will give the organizations efficient motor equipment to replace the old 1918 relics with which it is now burdened. There is also a two and a half million dollar tractor program on the boards which will serve to replace the old equipment of the tractor drawn organizations of the National Guard. The supply of up-to-date radio equipment for communication purposes was discussed as was also armament and equipment for the antiaircraft regiments of the National Guard.

The uniforming of the Guard with the new type elastique breeches and serge coats was discussed. This project is going forward as rapidly as funds are available and it is hoped that all units will be completely equipped by 1938. Other future hopes include laced boots for the artillery, slacks for the doughboy—and khaki shirts for all. This whole program will cost less than half the price of a modern battleship and will provide for the equipment and training of a field army of 185,000 officers and men.

General Leach also discussed the motorization of the field artillery and indicated the vast savings that could be effected through such process. The figures were most illuminating and interesting. He estimated the savings to be more than a million three hundred thousand dollars if all of the organizations could be motorized.

The air corps problems were touched upon understandingly. The matter of discontinuing the Junior airplane pilot ratings in the National Guard was discussed and General Leach presented some interesting figures to prove his contentions. Since 1924 the Na-

tional Guard has had 147 crashes. Of these, 117 of the planes were being flown by pilots with J. A. P. rating. This is especially significant when it is stated that there are only 85 junior pilots as against 221 airplane pilots in the National Guard.

This latter subject was referred to the committee of the Air Corps Commanders, the authorization for which was included in another resolution passed by the convention.

Among the social features of the convention was an old time Virginia oyster roast staged on the lawn of the famous Cavalier Club at Virginia Beach. Genuine Lynn Havens taken from their native habitat close by supplied the outstanding feature of the occasion.

On Friday evening there was a reception and dance at the Monticello Hotel which was attended by practically all of the delegates and their ladies. The affair was supplemented by large parties of Norfolk people and the affair was one of the most colorful in National Guard convention annals. The arrangements by Colonel Sands and his efficient corps of officers of the 111th Field Artillery were complete in all details and they are deserving of much credit for the way in which they put it over.

The first speaker on the program for the second day was Major General Paul B. Malone, Commanding General of the Third Corps Area, who made a stirring address in which he outlined his pre-war experiences with the National Guard and the post-war progress of that great body of citizen soldiers. General Malone touched upon those vital aspects of National Defense in which the National Guard plays such an important part and paid compliments to the patriotism and splendid work of the National Guard.

Colonel L. Kemper Williams, the president of the Reserve Officers Association, then addressed the convention and expressed his sincere appreciation of the harmonious relations which exist between the National Guard and Reserve components of the Army of the United States. He voiced the confidence that these relations would be maintained in the future.

Honorable Frederick H. Payne, Assistant Secretary of War, addressed the convention on Friday afternoon. In well chosen words he outlined the legislative situation with which the War Department was confronted at the last session of Congress, and expressed sincere appreciation for the splendid manner in which the National Guard authorities came to the support of the Army.

General Andrew Moses, Assistant Chief of Staff G-1, represented the General Staff and made an address which was received by the delegates with much pleasure and profit.

The final session, held on Saturday forenoon, was given over to the reports of the Place and Time Committee for the convention of 1933, which is to be held in Chicago, Illinois, at a date to be decided upon by the Executive Council; the report of the Nominating Committee and the election of the officers thus nominated, who were General Claude V. Birkhead, Texas National Guard, President; General Matthew A. Tingley, Iowa National Guard, Vice-President; General Fred M. Waterbury, New York National Guard, Sec-

retary; General Milton A. McLean, Kansas National Guard, Treasurer. The Executive Council for the ensuing year was then elected. They are General William F. Ladd, Connecticut, First Corps Area; General John J. Phelen, New York, Second Corps Area; Colonel Washington Bowie, Maryland, Third Corps Area; General Albert H. Blanding, Florida, Fourth Corps Area; General Robert H. Tundall, Indiana, Fifth Corps Area; General Frank R. Schwengel, Illinois, Sixth Corps Area; General Ellard A. Walsh, Minnesota, Seventh Corps Area; General Charles E. McPherson, Oklahoma, Eighth Corps Area; and General Thomas E. Rilea, Ninth Corps Area.

The above named officials for the ensuing year were duly inducted into office and made short talks of acceptance, pledging their service to the National Guard Association and the National Guard.

Among the other resolutions passed by the convention were the usual ones acknowledging and expressing appreciation for the hospitality and friendliness displayed by the Virginia National Guard and the citizens of Norfolk.

General Leach, Chief of the Militia Bureau was commended for his splendid service over the year of his incumbency in office as follows:

BE IT RESOLVED by the National Guard Association of the United States in Convention assembled in the City of Norfolk, Va., on October 21, 1932, that the National Guard of the United States commend the Chief of the Militia Bureau for the administration of the affairs of that office during the extremely trying times of the past year, and that it express its approval of the policies which have been adopted to meet an extremely critical situation especially with reference to its finances.

A committee composed of three commanding officers of Air Corps squadrons was authorized for the consideration of problems arising in that arm of the service. The committee is to be appointed by the President of the Association. The matter of aeronautical rating was assigned to that committee for study and recommendation.

A resolution was adopted which provides for the establishment of a policy authorizing a command post exercise each year in each Corps Area along the line of the one conducted in the Sixth Corps Area last year. The Militia Bureau funds are now available for one of such exercises each year.

Another resolution provides for a change in Regulations which will permit those organizations whose history dates back beyond the Revolutionary War to wear the streamer of that war on their colors.

A National Guard Memorial at Washington was favored by the Association and so indicated in a resolution adopted which covered the subject.

A modification of the regulations with respect to the procedure for the selection of National Guard candidates for the U. S. Military Academy was adopted. It called upon the Executive Council to study the subject and make the necessary recommendations.

For the past several years the Militia Bureau Bud-

get has been curtailed below the amount known to be necessary for the proper training, supply and administration of the National Guard. A resolution was adopted petitioning the Congress to include in the Budget the amounts necessary for the purpose and thus eliminate the necessity for a Militia Bureau deficiency bill each year.

A resolution looking to the early enactment of the National Guard Bill was also passed. This Bill has been before the Congress for several sessions and has each year been crowded into the discard by the legislative congestion at the end of the session.

All in all the convention was one of the most notable in the history of the National Guard. Much constructive action was taken for the improvement of the National Guard component and it is estimated that much good will arise out of it.

The Executive Council will meet early in December and work out the program of procedure, with respect to the responsibilities with which they are charged under the resolutions adopted by the convention.



Major General George E. Leach, Chief of the Militia Bureau, reviews his old Brigade at Camp Ripley, Minnesota.



Camp Ripley, the New Camp of the Minnesota National Guard at Little Falls, Minnesota.

COAST ARTILLERY BOARD NOTES

Communications relating to the development or improvement in methods or material for the Coast Artillery will be welcome from any member of the Corps or of the Service at large. These communications, with models or drawings of devices proposed, may be sent direct to the Coast Artillery Board, Fort Monroe, Virginia, and will receive careful consideration.—A. H. Sunderland, Colonel, C. A. C., President.

THE COAST ARTILLERY BOARD

Colonel A. H. Sunderland, C. A. C., President

Major Ira A. Crump, O. D.

Captain H. D. Mabbott, C. A. C.

Colonel J. C. Ohnstad, C. A. C.

Major J. D. McCain, C. A. C.

Captain J. T. Lewis, C. A. C.

Captain S. L. McCroskey, C. A. C.

Projects Completed During September-October, 1932

No. 829-B. Instruments for Training Stereoscopic Observers.—Two trainers, listed as Stereoscopic trainers T-3 and T-4 and manufactured by Bausch and Lomb, were tested in comparison with the standard Trainer M-1 which is manufactured by the S. O. M. Company of France. The Coast Artillery Board found that the Bausch and Lomb Trainers were not so well adapted to the selection and training of observers as was the S. O. M. Trainer. The Trainer T-3 contains provisions for simulating readings on a moving target. The Coast Artillery Board recommended that either the S. O. M. Trainer or the Trainers T-3 and T-4 be modified to produce ideal stereoscopic training instruments. These modifications consisted of improvements to the optical system, supply of additional slides and the inclusion of provision for reading on moving targets.

No. 887. Test of Height Finder T-12.—The 6-meter Stereoscopic Range and Height Finder T-12 was given a comparative test at Aberdeen Proving Ground with the 4-meter Stereoscopic Range and Height Finders T-9 and T-15. The 6-meter instrument did not show sufficient accuracy to justify the increased weight and expense, and the Coast Artillery Board accordingly recommended that either the T-9 or the T-15 be continued as the standard type and purchased to fulfill immediate needs and that the Range and Height Finder T-12 be tested on water targets to determine its usefulness as a range finder for tractor artillery.

No. 905. Preparation of Coast Artillery Memorandum No. 13.—The Coast Artillery Board submitted a proposed draft for Coast Artillery Memorandum No. 13. This draft contains comments on target practices fired during the Fiscal Year 1932.

No. 910. Test of Field Telephone, Type EE-8-T2.—This telephone was designed to replace the standard type of field telephone. It was a decided improvement over the existing types but needed several modifications. The Coast Artillery Board recommended that

certain modifications be made and that the component parts of the telephone be standardized with the exception of the buzzer.

No. 921. Test of Light Weight Experimental Mask E27R4-E8R34-E8R47.—This mask was designed to permit carrying the canister on the shoulder. It was not entirely satisfactory and the Coast Artillery Board recommended that a further study be made of the mask with a view to relieving the discomfort to the chin.

No. 922. Comparative Test of Harrison and Signal Corps Time Interval Apparatus.—The Coast Artillery Board has tested three types of time interval apparatus and accepted the one manufactured by the Signal Corps. The Board recommended that (a) the Signal Corps Time Interval Apparatus, Type EE-85-T2, be provided with drums making one complete turn in 120, 90, 84 and 66 seconds, respectively, and providing time intervals of 1, 3, 10*, 12, 14*, 15*, 18, 20*, 22, 24, 28, 30, 33, 40, 42* and 45* seconds, those marked with an asterisk being provided with a warning bell three seconds before the first stroke of the three-stroke signal on every other bell; (b) auxiliary apparatus consisting of a tone signal system with relays be provided in units of two independent circuits, each circuit with sufficient power to operate two gun firing signals and to superimpose a tone of four separate telephone lines; (c) relays of proper design be provided for operating the Signal Corps Time Interval Apparatus, Type EE-85-T2, with the present time interval bells in the 30-volt harbor defense systems, and that relays for the tone system be incorporated in the tone signal box for mobile artillery use; (d) a rugged tone signal be developed for a gun firing signal; (e) an auxiliary tone producing apparatus and gun firing signal be designed and submitted for test; and (f) the Signal Corps Time Interval Apparatus, Type EE-85-T2, be standardized for use with mobile coast artillery but that the standardization as a substitute for the Time Interval Apparatus, Type EE-56, for fixed defense use, be held in abeyance until the development and test of satisfactory auxiliary apparatus.

No. 924. Test of Signal Lamp Equipment, Type EE-84-T1.—The Signal Lamp tested was a small portable outfit operated by commercial dry cells and capable of long range signalling between ground units. The Coast Artillery Board recommended that minor modifications be made to this lamp and that it then be accepted as suitable replacement for the Signal Lamps Types EE-6 and EE-7. It was further recommended that the lamp be issued to harbor defenses and fort signal stations.

No. 930. Test of Strickler Folding Table.—This table was submitted as a replacement for the standard issue field table and was found superior to both the standard issue table and to the Symmonds table recently tested by the Coast Artillery Board. The Coast Artillery Board recommended that, after minor modifications, this table be adopted as standard and issued to the service.

No. 935. Test of A. C. Spark Plugs.—The Coast Artillery Board recommended that (a) an unused set of Splitdorf plugs of the type reported as failing, be returned by the Commanding Officer, Harbor Defenses of Pearl Harbor, for comparative test with the Type P-685 by either the Coast Artillery Board or the Corps of Engineers; (b) A. C. plugs, Type L-8 or L-9, be furnished in limited quantities to the Panama Canal Department and the Hawaiian Department for use in the motors of 25 K. W. sets as a substitute for the Splitdorf type; and (c) no final rejection of the Splitdorf type plug be made until a test of the type complained of has been given a test as recommended in (a), above.

Projects Under Consideration

No. 608-A. "Duco" Surfacing for Guns.—Painting completed—report will be made about July 1, 1933.

No. 800. Test of Radio Direction Finders.—Under study.

No. 814. Illuminating Device for 12-inch Barbette Carriage Model 1917.—Test completed—report in preparation.

No. 871. Azimuth Pointer for 12-inch BC M1917.—Report in preparation.

No. 873. Service Test of Long Distance Seacoast Data Transmission System T-16.—Test completed.

No. 874. Service Test of Seacoast Data Computer T-3.—Test completed.

No. 886. Comparative Test of Antiaircraft Directors (T-3; M-2; and M1A1 uncoupled).—Awaiting results of tests at Aberdeen Proving Ground.

No. 901. Modified Shot Truck and Guide for 12-inch BC, M1917.—Test completed—report in preparation.

No. 915. Test of N. H. Powder Charges (D. P. Lot X-3701) for 12-inch Mortar M1890.—Test completed—report in preparation.

No. 920. Test of Fire Control Tower for Tractor Drawn Artillery.—Test completed—report in preparation.

No. 926. Test of Homelite Generating Unit.—Awaiting receipt of material.

No. 927. Test of Radio Set, Type SCR-177.—Under test.

No. 929. Experimental Field Chronograph (Jackson).—Under study. Awaiting monthly progress report from Captain Jackson.

No. 931. Test of Roller Bearing, 3-inch Antiaircraft Gun Truck Mount T1.—Under test.

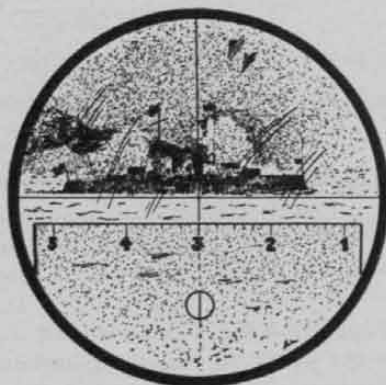
No. 932. Diaphragm Gas Masks E3R111-IV-III.—Under study.

No. 934. Test of .50 Caliber Machine Gun Equipment.—Test completed—report in preparation.

No. 936. Test of Firing Dynamo T1.—Under test.

No. 937. Test of Submarine Mine Equipment.—Under test.

No. 938. Test of Binocular Comparator-Controller.—Test at Fort Humphreys completed. Undergoing further test at Fort Monroe.



PROFESSIONAL NOTES

Coast Artillery Mobility

THE following paragraph abstracted from an official report is of interest to all students of mobility possible with pneumatic motorized vehicles.

"After the 1932 Annual Searchlight Practice of this Battery at Fort Humphreys, Virginia on September 28, 1931, the Battery returned by motorized march to Fort McClellan, Alabama, arriving on October 17, after traveling 900 miles in five days. Further training of drivers, light and locator crews was gained by means of a demonstration march and joint Air Corps—Antiaircraft demonstrations at the Miami Air Races, January 2-14, and the Tampa Air Races, January 17-21, and throughout Florida in connection with the Florida State Air Tour. Daily marches of two hundred miles were the average performance on the road during this period. A week after returning from Miami the Battery participated in a regimental convoy and demonstration at Montgomery Airport for the instruction and training of students of the Air Corps Tactical School. Joint exercises with nine bombers of the 96th Bombardment Squadron and Attack ships of the Tactical School were conducted. In April a similar exercise was held including Mobile and New Orleans in the itinerary. Short marches in the immediate vicinity of Fort McClellan and to Fort Benning for Command Post Exercises and for conducting night machine gun practices were held during May and June. A march and night demonstration at Birmingham Airport by all elements of the regiment, participated in by this Battery, in connection with the training of the 540th C. A. (AA), proved to be the most perfectly coordinated and satisfactory demonstration ever conducted by the regiment. The road training of drivers and mechanics was continued in connection with the trip to Fort Barrancas, Florida, and the training of Reserve Officers of the 4th and 8th Corps Areas at that station and by assisting in the training of the Illinois, Missouri and Arkansas National Guards' Antiaircraft Regiments. The equipment of the Battery was used by all these components of the Army of the United States and personnel of all grades of this organization rendered continuous instruction throughout July and August. The total distance traveled by searchlight trucks and sound locators since last target practice is seven thousand miles. Number of searchlight miles is three thousand."

The march to New Orleans, from Anniston, in April, illustrates the readiness for movement achieved by the 69th Coast Artillery (AA). Orders for the movement with no prior "alert" were received at 11:00 A. M. and the convoy, to reach New Orleans for the scheduled demonstration, left Fort McClellan at dawn the day following.

Aeroplane Spotting for the 605th C. A. (Railway)

By Major F. J. Baum, 605th C. A. (Ry)

DURING the encampment of the 605th C. A. (Ry) at Fort Funston, California, airplane spotting was obtained for the record practice fired by Battery A, on May 23, 1932.

The Battery fired a single gun, 155 mm GPF, emplaced close to the waterline. Firing consisted of four trial shots and sixteen record shots.

Through the courtesy of the Commanding Officer, Crissy Field, Presidio of San Francisco, a plane for spotting was placed at the disposal of the Commanding Officer of the 605th C. A. (Ry).

The firing took place between 9:50 A. M. and 10:08 A. M. The Battery was fortunate in being able to get off their entire shoot of twenty shots in this short period of eighteen minutes.

A comparison of the "T-1" Spotting Board, Airplane Spotting, Camera Records and actual Plotted Shots is given below and forms a most interesting comparison.

	Shot:	Actual Range:	Spotting Board (Yds.)	Airplane: (Yds.)	Camera: (Yds.)	Plotted Shot:	Airplane Error:
TS	1	9810	S 167.5	S 200	Lost	S 438	238
	2	9140	S 347	S 100	S 206	S 210	110
	3	9100	S 355	S 200	S 303.5	S 303	108
	4	9120	Lost	S 400	S 291.5	S 309	91
RS	1	9220	Lost	S 500	S 597	S 546	46
	2	9280	Lost	S 500	S 495	S 483	17
	3	9310	Lost	S 500	S 484	S 493	7
	4	9340	S 485	S 500	S 419.5	S 412	88
	5	9420	Lost	S 600	S 471	S 624	24
	6	9460	S 615	S 500	S 393.5	S 538	88
	7	9500	S 665	S 600	S 435	S 606	6
	8	9560	S 191	S 100	S 153	S 184	84
	9	9600	S 154	*S 700	S 118.5	S 58	*642
	10	9640	O 96	*O 500	O 63.5	O 60	*440
	11	9680	S 300	S 150	S 221.5	S 277	127
	12	9740	S 39	S 10	S 23.5	S 29	19
	13	9780	O 68	O 50	O 61.5	O 63	13
	14	9840	O 69	O 40	O 46	O 45	5
	15	9900	Hit	S 20	S 27.5	S 29	9
	16	9950	O 20	O 10	O 9.5	O 9	1

The airplane spotting may be considered as excellent, being especially accurate at short deviations. The two reports marked with a *, shots 9 and 10 were in great error when compared with the plotted deviations. It is quite possible that this error was due to an erroneous reception by the radio receiving operator. This is thought to be the case due to the fact that the airplane reports before and after these two shots were very nearly the same as the plotted impacts; one being only 1 yard, the plotted impact on the 16th record shot being over 9, and the airplane reporting over 10.

Airplane spotting in the future (according to the new regulations) will be made with the plane about midway between the gun and the target instead of over the target as in the past. It is believed that this will result in even greater accuracy in airplane spotting.

Regular Army Batteries Rated Excellent During Year 1932

Regiment	Locality	Battery	Battery Commander	Name of Battery	Caliber
1st	Panama Canal Dept. -----	Hq. A D	Capt. A. L. Haggart Capt. R. J. Imperatori Capt. C. R. Adams	Stanley	14" DO 3" AA & MG MG
4th	Panama Canal Dept. -----	G B C	Capt. J. T. Campbell Capt. E. W. King Capt. J. C. Bates		14" Ry. 3" AA & MG MG
6th	Ft. W. Scott, Calif. -----	A	Capt. C. H. Armstrong		Mines
11th	Ft. H. G. Wright, N. Y. -----	H	1st Lt. G. L. Field	Butterfield	12"
14th	Ft. Worden, Wash. -----	D G	Capt. G. W. Hovey Capt. K. Rowntree	Benson Walker	10" 3" & Mines
15th	Hawaiian Dept. -----	A B C	Capt. LeR. Lutes Capt. B. P. Foster Capt. A. L. Lavery	Selfridge Selfridge Jackson	12" 12" 6"
16th	Hawaiian Dept. -----	A D	Capt. P. S. Lowe Capt. M. Bottoms	Dudley	6" 155 mm.
52d	Ft. Hancock, N. J. -----	O E	1st Lt. F. B. Dodge Capt. C. L. Berry		12" M. Ry. 8" Ry.
55th	Hawaiian Dept. -----	B	1st Lt. O. A. Nelson		155 mm.
59th	Philippine Dept. -----	A B F	Capt. L. R. Crews Capt. S. McCullough Capt. G. W. Whybark	Smith No. 2 Crockett Smith No. 1	12" 12" 12"
60th	Philippine Dept. -----	A B C	Capt. H. H. Blackwell Capt. D. E. Morrison Capt. E. L. Barr		Sl. 3" AA 3" AA
61st	Ft. Sheridan, Ill. -----	E	2d Lt. J. J. Holst		MG
62d	Ft. Totten, N. Y. -----	B C E	Capt. J. G. Murphy Capt. M. G. Handwerk Capt. F. Lofquist		3" AA 3" AA MG
63d	Ft. MacArthur, Cal. -----	B E	Capt. C. S. Harris Capt. D. J. Rutherford		3" AA MG
64th	Hawaiian Dept. -----	A E	Capt. J. D. Brown Capt. A. V. Winton		Sl. Sl.
69th	Ft. McClellan, Ala. -----	A B	1st Lt. J. L. Goff Capt. H. A. McMorrow		Sl. 3" AA
91st	Philippine Dept. -----	B C G	Capt. N. Boudreau Capt. H. P. Hennessy 1st Lt. W. H. Kendall	Morrison Geary Ramsay	6" SC 12" M 6"
92d	Philippine Dept. -----	A B C	1st Lt. J. S. Henn Capt. G. W. Brent Capt. C. H. Armstrong	Maxwell Keys	3" SC 155 mm. 155 mm.
Prov. Mine Btry.	I Corps Area -----		Capt. Wm. Hesketh		Mines

An interesting fact about the airplane spotting recorded above is that the plane was at such a high altitude it was not seen by the battery and no one at the emplacement had any knowledge that airplane observation was being used.

Armory Training and Target Practice 243d C.A.(HD)(R.I.N.G.)

By Maj. A. E. Rowland, C. A. C.

THE continuous improvement in the target practice scores of the 243d C. A., R. I. N. G. brings a request from the editor of the C. A. JOURNAL that an article be written describing the training methods used in producing the improvement. Specifically the results have been: In 1929, at the time I reported for duty as instructor, the average target practice score for harbor defense guns was 34.8; in 1930 it was 58.9, with one battery rated excellent; in 1931 it was 91.2, with four batteries rated excellent; and this year the average score is 97.5, with all batteries scoring over 90 and expected to be rated excellent. (We also have an anti-

aircraft battalion consisting of a gun battery, machine gun battery and a searchlight battery, which has raised its score from about 10 to 85, but this discussion will be limited to harbor defense armament only.)

Before considering training, the method of conducting target practices should be considered. Its importance is often overlooked. I have heard it said that any method used by a well trained battery will give good results. Maybe so—sometimes—when luck is with them—but the percentage of good practices will be low compared to a well trained battery using methods that reduce the element of luck to a minimum. We have given our first attention to improving our methods of conducting practices.

Target Practice Methods

Formerly, in this regiment, trial shots were fired at a fixed invisible point, Case III. Splashes were plotted on the plotting board. A range correction for the C I of trial shots was applied as a percentage of range to record fire. Then the advantage of trial fire was promptly lost in a large measure by beginning adjustment all over again with the first record shot, often disastrously because corrections were based upon un-

reliable terrestrial observation. For direction, a correction was determined and applied to mortar fire, but none to gun fire, entire reliance being placed upon the gun pointer's jumping splashes, the use of the deflection board being abandoned after the first record shot.

We changed trial fire to the moving target, Case II for guns, Case III for mortars. The advantages of this are rather obvious, the principal one being that it gives a deflection correction which includes the error involved in predicting the travel of the target during the time of flight, and others that it gives additional training to the spotting section and to the gun pointer, and provides an opportunity to check their work prior to record fire. An illustration of its checking value is one of our 10-inch gun practices when the gun sight jarred over a quarter of a degree out of adjustment during trial fire, but was discovered and remedied before record; it is doubtful if it would have been discovered if pointing had been done by Case III at an invisible point. Trial fire at the moving target is now required by regulation.

By firing trial shots at two minute intervals, in the bell, we synchronize splashes with range finding so that they can be jumped by observers, plotted on the plotting board, their deviations measured from the setforward-point without interrupting the ordinary processes of range finding, and corrections can be determined, applied and checked by the range officer without unduly hurrying him or any other member of the range section. Measuring deviations from the SFP instead of from the target eliminates the error of prediction, which in some cases may be considerable. For example there is attached a tracing of a mortar practice showing the error of prediction for the first trial shot to have been very large, owing to a change

in the course of the target, and similarly to a lesser degree for the second and third trial shots.*

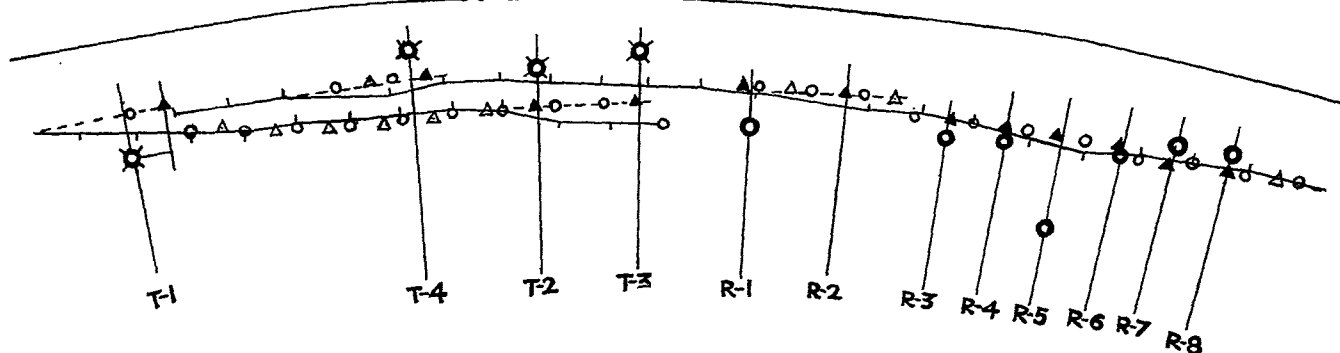
Accurately measured deviations, as accurate as the range finding, are absolutely essential to correct adjustment of fire. Plotting splashes on the plotting board by the range section gives measurement as accurate as the range finding, as accurate as any method of spotting, and more accurate than any we have been able to develop. It is entirely practicable when firing a single gun or salvos at one minute intervals, the normal rate of fire for 8-, 10-, and 12-inch guns and fixed mortars. The spotting section is also trained and spots from the target, its results being used when more accurate data is not available. In ordering corrections, the number of yards desired is announced by the range officer and the operator of the percentage corrector applies it as a percentage by sliding the arbitrary pointer along the range scale the number of yards ordered. Successive approximations are used.

The gun pointer is not allowed to jump any splash, he must use the deflection furnished from the plotting board. The deviation of each splash is read on the internal scale of an azimuth instrument and is transmitted to the plotting room, where it is applied to the deflection board as a reference number correction. To apply corrections to the Model 1905 deflection board, the deflection is read from the movable slide, the numbers 14, 15 and 16 being changed to 2, 3, and 4 respectively, and the slide being moved the amount of the correction desired. Mental calculation can be eliminated by attaching above the movable slide, and opposite the number 21, a movable index, and changing the numbers 20, 21 and 22 to read 2, 3 and 4.

* Note: this practice is far from being a model, but is selected because it illustrates best the points it is desired to illustrate.

BATTERY A 243D C.A., RING 12-INCH MORTAR

OUTER RANGE LIMIT OF ZONE



- — — Track of target
- | Plotted point
- Predicted point
- △ Setforward point
- ▲ SFP on which mortar was laid
- Splash as plotted by range section

Interference in field of fire caused some delay between T-1 and T-2, and 2 hours delay between T-3 and T-4.
R-1 fired 6 minutes after T-4.

The correction is applied by moving the slide until the splash reading is opposite the movable index; to be ready for the next correction then move the index to a new position opposite the number 3. For successive approximations divide the deviation by the number of the splash before it is applied. In this way is secured a correction for the CI of the trial shots (which would not be the case if the gun pointer were jumping splashes) and the correction is incorporated in a properly computed deflection which takes into account the changing effects of wind, drift, and travel during the time of flight (impossible when the deflection board is not used after the first record shot). The principle is the same for mortar deflection correction, though the deflection board is differently constructed.

The 6-inch battery is required by regulation to use the bracketing method of adjustment, therefore a modification is required in its trial fire. When a shot is fired, the gun arm is brought to the SFP and a line drawn along the edge of the arm. When the secondary observer sends in the azimuth of the splash (which is as practicable as reporting an over or a short) the secondary arm is set to the azimuth and the range officer sees at a glance whether the splash is over or short of the SFP, also the approximate amount of the deviation, by noting the location of the intersection of the edge of the secondary arm and the line previously drawn. It is quite important to know the approximate amount of the deviation when, as was the case in our practice, the first shot was three forks over, and applying corrections one fork at a time without getting a change of sense would not only waste ammunition but might badly confuse the range officer. This method is not, of course, applicable to record fire, owing to the rapid rate of firing, and dependence must be placed upon overs and shorts reported by a spotter in secondary station.

Record fire follows trial fire as promptly as possible, and is a continuation of the trial series and methods, except that the rate of fire is speeded up to one shot per minute, and airplane and terrestrial spotting are used when plotted splashes are not available. The attached tracing of mortar practice illustrates the method, there being a six minute interval between the last trial and the first record shot; it shows how vividly the relation of splashes to target and to SFP is apparent to the range officer a few seconds after each splash occurs, permitting him to distinguish between deviations due to erroneous predictions and to other causes. In case record fire does not follow promptly after trial fire, true successive approximation is not continued, but a larger fraction of the deviation, not exceeding one-half, is applied depending upon the judgment of the range officer as to the cause of the deviation. In the case of mortars, due to the long time of flight of the projectile, the mortar is laid in azimuth for the second shot before the first splash occurs, therefore the azimuth correction applied goes on the third shot. To get it on the second shot the battery commander sets the movable pointer in his BC instrument to the correction

reference number, and fires the second shot on the pointer instead of on the bell or the wire; with the third shot he resumes firing on the wire or the bell. A range correction cannot be applied to the second shot after the first splash, without a relay.

Uniformity of loading during both trial and record fire is given the greatest stress. Powder charges are weighed carefully, the ones varying most from the average weight being selected for trial fire, since their greater dispersion will not affect the accuracy of locating the center of impact. Powder bags are sized and the ends made perpendicular to the axis of the charge to prevent buckling when ramming. Accuracy in range setting and in pointing are given preference over speed. Uniformity in ramming does not mean ramming as hard as possible, but it means seating the projectile in exactly the same way every time. Those batteries that have given most attention to uniformity of loading have developed dispersion errors much smaller than those given in the table for computing scores: 6-inch, 37.5 yds; 10-inch, 38 to 55 yds; 12-inch, 22 to 36 yds; 12-inch mortar, 37.5 yds.

A well trained battery conducting its practice as outlined above will almost certainly secure a score that it need not be ashamed of. But it must be well trained, and the training must be secured in the armory before coming to camp. In the case of most batteries there are no dummy guns for use at armory drill, and the actual gun drill must be done at camp. For range finding all batteries are satisfactorily equipped in the armories and by following the methods described below range sections are well trained during the armory period.

Armory Training

The method of armory training in use in this regiment in 1929 was tracking a miniature target, with some attempt at analysis of drill. This method is unsatisfactory because it is inefficient. If the drill is not analyzed, men make mistakes which are not discovered, thereby acquiring the habit of inaccuracy. If the drill is analyzed, half the drill period is lost doing the analysis, and little good is accomplished because the mistakes are all called to the men's attention in one batch at the end of the drill when the men are tired, sleepy, about to go home, and they will have forgotten most of it by the next drill a couple of weeks later. There are not more than 12 or 15 real artillery drills of a little more than an hour each during the season, held at night after men have already done a day's work, and their attention hard to keep. To get the most out of these few drills, the method of instruction must be of a type that will keep the men awake, attentive, that will catch every mistake the instant it is made, and insure the proper instruction being given to correct the mistake at once. This system we now have.

Plotting boards in all armories are set up on the same orientation data. The instructor takes base-end azimuths from an actual target practice (or a fictitious course) and determines and records in parallel columns on a master sheet the correct data which

should determine by each member of a range section on every bell. Between bells is an additional pair of azimuths from an assumed splash, and the splash range and lateral deviation. At the top of the sheet is the orientation data, the normal muzzle velocity, powder temperature, weight of projectile, meteorological message, and all other data which would be available to a range officer at target practice. This sheet is given to the battery commander.

For drill, the BC gives the RO the data at the top of the sheet; to the observer he gives the lists of azimuths, with instructions to set the azimuths on the observing instruments, not letting the readers see the lists, and requiring the readers to function exactly as if a target were being tracked. When the RO reports ready for drill, the BC assigns a target, naming the course to be used and the bell on which tracking is to begin. Tracking proceeds in the usual manner, complete records being kept by everyone. The BC compares firing data posted with that given on the master sheet. Whenever firing data does not agree, the BC gives the command "Stand by," all activity ceases instantly, and records are compared with the master sheet. A minute should suffice to find the person responsible for the error, and a qualified person is assigned to instruct him while the drill immediately proceeds at the command "Resume tracking, Bell—." It is not necessary that tracking be resumed at the point where it was left off, as it may be desirable to recover a portion of the course.

When the range section had been sufficiently well trained in turning out correct firing data, the BC may begin training in adjustment. At any desired point on the course he orders firing begun. The procedure is exactly that described for target practice, a primer being fired in the dummy gun or other means used to notify the plotting room when a shot has been fired. At the sound of a shot, the arm setters call to the readers "On the way," and at the expiration of the time flight, determined by a stop watch holder, "Splash." A few seconds after "Splash" the stop watch holder calls to the RO the value of the lateral deviation given on the master sheet. When the readers repeat "On the way" each observer sets the splash azimuth occurring on his list next below the last azimuth set, and when his reader repeats "Splash," he permits the splash azimuth to be read. In plotting rooms, the mortar plotter predicts as usual, but the gun plotters omit the prediction for the bell on which a shot is fired, since the data would not be used anyway. The splash is plotted and the range read, or its deviation may be measured directly from the SFP.

The RO determines, orders and checks corrections exactly as described for a regular target practice. He keeps a complete record of his work for subsequent check with the BC. The application of corrections changes the firing data and accordingly the BC must take into consideration the net corrections when comparing adjusted firing data with the master sheet.

The foregoing procedure trains everyone except the

observers and spotting section in their proper duties. The observers are trained by drill in tracking the miniature target. The spotting section is trained on the miniature target by arranging a system of lights along the track of the target, in various positions with respect to the target, so that they are illuminated for a few seconds as the target passes each point. The first design carried the lights with the target, but this was unsatisfactory because splashes do not move with the target, but remain stationary while the target moves.

Armory training of gun crews in armories that have no dummy armament is mainly theoretical, with the assistance of the imagination and such materiel as can be improvised. Where dummy armament is available, the same care is used in handling dummy ammunition to secure training in uniformity of loading as will be used later at camp. I cannot emphasize too strongly the importance of training in uniformity of loading.

Entirely out of place here may be a comment on target practice regulations, but nevertheless I wish to make it. The regulations for target practice have been constantly improved during recent years. We are now required to fire trial shots at a moving target, presumably representing the enemy ship we are to engage. There is no definite requirement that the trial shots shall be on the same course as the record nor within any definite time limit. I believe we can complete the trial fire and begin the record in ten minutes if we have to. We take a lot of unnecessary time in handling trial fire because there is no penalty for so doing, but if the target represents an enemy ship time is important, too important to waste. I should like to see the regulation changed to require the first record shot fired within ten minutes after the first trial shot, including the time required to change pressure plugs after the fourth trial shot; a penalty of one point from the score for each minute over ten, and a bonus of one point for each minute under ten.

Classification of Officers

THE classification tables of officers of the Coast Artillery Corps over a period of four years (1929-1932) are published below. There is a well founded opinion held by many officers that the present rating system is not all it should be. However that may be it is certain that there is room for improvement and that efficiency reports should not be prepared in a haphazard or hurried manner. Examination of the tables over several years disclose obvious absurdities. For instance in 1929 not a single lieutenant was rated superior. It is difficult to believe (and down-right discouraging) that there were no *superior* lieutenants in the Coast Artillery Corps in 1929. Especially when other arms of the service had them. There has been much improvement in the last four years—more officers rated "excellent" and "superior." The percentage table discloses one peculiar fact (for those who like to grovel in these details). Why are the lieutenant colonels so much better than any one else? Is it

their diet? (As was the case with J. Caesar.) And most of their improvement has taken place in the last year. Perhaps it was the Depression. But here are the tables. Work it out for yourself.

	Superior	Excellent	Satisfactory	Unsatisfactory	Inferior	Not rated	Totals
1929							
Colonels	8	28	16	--	--	--	52
Lt. Col.	7	32	20	--	--	--	59
Majors	12	127	87	--	--	--	226
Captains	2	139	140	1	--	--	281
1st Lieuts.	--	81	138	--	--	1	220
2d Lieuts.	--	25	117	1	--	34	177
Totals	29	431	518	2	--	35	1015

1930							
Colonels	8	29	17	--	--	--	54
Lt. Col.	8	35	12	--	--	--	55
Majors	22	138	88	--	--	--	218
Captains	8	155	91	1	--	1	256
1st Lieuts.	3	130	119	--	--	2	254
2d Lieuts.	1	36	89	1	--	30	157
Totals	50	523	386	2	--	33	994

1931							
Colonels	8	25	13	--	--	--	46
Lt. Col.	12	32	10	--	--	--	54
Majors	24	143	46	--	--	--	213
Captains	8	165	83	--	--	--	256
1st Lieuts.	6	150	99	--	--	--	255
2d Lieuts.	1	47	83	--	--	49	180
Totals	59	562	334	--	--	49	1004

1932							
Colonels	11	22	11	--	--	--	44
Lt. Colonels	24	41	7	--	--	--	72
Majors	35	135	24	3	--	--	197
Captains	26	168	56	3	--	--	253
1st Lieuts.	21	176	70	--	--	--	267
2d Lieuts.	6	61	79	--	--	52	198
Totals	123	603	247	6	--	52	1031

PERCENTAGE OF OFFICERS RATED IN GRADES
1932

	Superior	Excellent	Satisfactory	Unsatisfactory	Inferior	Not rated
Colonels	25%	50%	25%	--	--	--
Lt. Colonels	33%	57%	10%	--	--	--
Majors	18%	90%	12%	1%	--	--
Captains	10%	67%	22%	1%	--	--
1st Lieuts.	8%	66%	26%	--	--	--
2d Lieuts.	3%	41%	54%	--	--	--

National Guard Coast Artillery Batteries Rated Excellent

THE Chief of the Militia Bureau wishes to announce that the following National Guard Coast Artillery batteries have been classified as *Excellent* by the War Department for the year 1932:

Batteries A, F, G and H, 206th C.A. (AA), Arkansas National Guard.

Batteries C and E, 250th C.A. (TD), California National Guard.

Batteries B and E, 251st C.A. (AA), California National Guard.

Batteries B, C and D, 198th C.A. (AA), Delaware National Guard.

Batteries A and B, 264th C.A. Bn. (HD), Georgia National Guard.

Batteries C, D, E, F, G and H, 202nd C.A. (AA), Ill. National Guard.

Batteries A, B and G, 240th C.A. (HD), Maine National Guard.

Batteries B and F, 211th C.A. (AA), Massachusetts National Guard.

Battery D, 241st C.A. (HD), Massachusetts National Guard.

Batteries A, C and D, 203rd C.A. (AA), Missouri National Guard.

Batteries B and I, 245th C.A. (HD), New York National Guard.

Battery C, 252nd C.A. (TD), North Carolina National Guard.

Batteries C, D and E, 249th C.A. (HD), Oregon National Guard.

Batteries B, C and D, 213th C.A. (AA), Pennsylvania National Guard.

Batteries B, E, F, G and H, 243rd C.A. (HD), Rhode Island National Guard.

Batteries A and E, 263rd C.A. (HD), South Carolina National Guard.

Portable Electric Plant Designed by 211th Coast Artillery (Mass. N.G.)

By Major Raymond D. Fales, 211th C. A.

THE campsite for annual tour of camp duty of the 211th Coast Artillery (AA), Mass. N.G. (First Corps Cadets) being located some distance from electric lighting or electric service lines, the expense of



Generator and Electricians Who Furnished Tent Lights to 1st Corps of Cadets at Peter's Pond, South Sandwich, Mass., 1932.

running such lines to the camp area was found to be in excess of appropriations; therefore a requisition was forwarded for a "Portable Lighting Unit." There

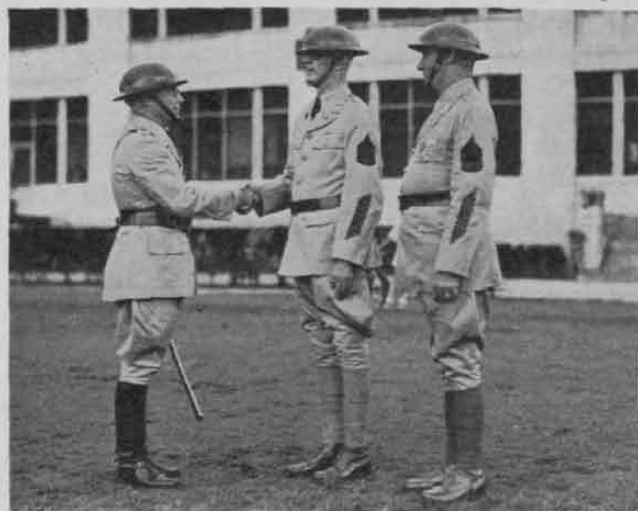
being no generator units available for issue from State or Federal sources, our Headquarters Detachment proceeded with the construction of such a unit involving very little expense.

The construction of this portable plant consists of four cylinder Nash chassis of the 1923 vintage stripped of everything but the wheels, frame, radiator and engine with a switchboard mounted on the rear of the chassis and a 15 KW. generator mounted directly over the drive shaft. The steering mechanism and the regular driving parts of the chassis still remain so that this unit can be driven under its own power.

When this plant has been properly located it is jacked up and placed on blocks. The drive shaft is disconnected at the rear universal joint and then raised up under the cross beams supporting the generator on the chassis, where it is placed in a split box. A split pulley and a roller bearing are placed on the drive shaft, these two parts remaining on the shaft permanently, so that when the drive shaft is disconnected from the rear end, the shaft with pulley and bearing are raised to a horizontal and level position with the bearing placed in the split box. A leather belt is then connected between the drive pulley and generator.

The next operation consists of throwing out the gears and starting the engine. After the engine has been warmed up, the gears are then engaged at a low speed and then the voltmeter is observed and the engine speed increased until the necessary amount of voltage has been obtained. The throttle is then set until the switches are thrown in, at which time the rheostat is used to regulate the proper amount of voltage going out to the various lines. Each battery street and officers' sections are under separate switches and are properly fused.

The wiring of the camp area and the general installation of the lighting system was done by men of the Hqrs. Det. with the aid of each battery stringing the wires over their own tents. The system furnished 60-50's, 100-25's, and 10-100 watt lamps. The old Nash was given the organization, the switchboard fittings cost \$25.00, the generator (second hand) cost \$10.00 and each battery paid its proportionate share for wire, sockets and bulbs and the 211th C.A. (AA) furnished their own electric lights at no cost to the State or Government. This portable unit formed part of the motor convoy back to the Armory and apparently will be able to perform the same service next year.



Lt. Col. G. Ruhlen, Jr., congratulating 1st Sgt. Richard F. O'Donnell and Master Sergeant John C. Fern at Ft. Amador on the occasion of their recent retirement.

(Editor's Note: Due to an interchange of cuts the above illustration appeared in the last number of the Journal with General Darrah's name in place of Col. Ruhlen's. Both are gunning for us. We apologize.)

COAST ARTILLERY ACTIVITIES

Office of Chief of Coast Artillery

Chief of Coast Artillery

MAJOR GENERAL JOHN W. GULICK

Executive

COLONEL W. F. HASE

Personnel Section

MAJOR G. F. MOORE

MAJOR S. S. GIFFIN

Materiel and Finance Section

MAJOR R. E. HAINES

MAJOR O. L. SPILLER

MAJOR J. H. COCHRAN

Organization and Training Section

MAJOR E. E. BENNETT

CAPTAIN J. H. WILSON

Plans and Projects Section

MAJOR G. R. MEYER

MAJOR R. V. CRAMER

Corregidor Notes

By 1st Lieut. G. F. Heaney, Jr., C. A. C.

THE transport "Republic" arrived on October 15, bringing the following C.A.C. officers to Corregidor: Col. M. A. Cross, Maj. LaR. L. Stuart, C. D. Peirce, and F. C. Scofield, Capt. J. B. Muir, A. C. Chesledon, J. H. Gilbreth, F. H. Hastings, A. M. Lawrence, W. F. Putnam, Jr., A. L. Bullard, and L. A. White, 1st Lieuts. L. E. Gray, H. H. Duval, O. T. Forman, G. G. Gibbs, and J. A. McComsey, and 2nd Lt. W. A. Call.

The following officers left for the U. S. on the transport, sailing from Manila October 21: Col. J. T. Geary (on account of sickness), Lt. Col. F. E. Williford, Maj. E. E. Bennett, J. F. Kahle, H. B. Holmes, and N. Dingley III., Capt. E. F. Olsen, G. W. Whybark, and G. A. Patrick, and 1st Lts. T. W. Munford, W. H. Burns, and E. C. Smallwood. Most of these officers left Corregidor some weeks earlier, and joined the transport in Chinwangtao or Nagasaki.

The transport brought a staggering number of children. The Coast Artillery has long been noted for its children, perambulators, clotheslines, etc. We are happy to know that the Corps is constantly striving to better itself in this line, as well as in the other branches of ballistics and logistics. Our able "Supt. of Schools," Captain E. B. McCarthy, had to hang out the "S.R.O." sign after this last boat arrived. And when the kids hit the Club swimming pool in the afternoon, it's just too bad for any of the neighbors who were thinking of trying a little siesta.

A four-hole golf course for soldiers has been built on Topside parade ground. It is intended to extend the course if the patronage warrants. This is part of General Embick's plan to increase the recreational facilities for the enlisted men.

For the information of officers under orders to this station, the following corrections are offered, to bring up-to-date the dope in the article on Corregidor, which appeared in the July-August number of the *JOURNAL: Automobiles*: Cars are no longer carried free on the transports, but are carried as paid freight. The freight rate is said to be about \$3 a hundred pounds from New York to Manila, and about half that from San Francisco to Manila. *Uniforms*: The new Q.M. khaki is replacing the Hongkong; either one may be worn at present.

Review of the New York Coast Artillery Brigade

ON December 2, 1932, at the Armory of the 13th Regiment, (245th CA NYNG) The Coast Artillery Brigade, New York National Guard, was reviewed by Major General John W. Gulick, Chief of Coast Artillery, USA. This was the first time that the Brigade was together under one roof since its formation, as a Brigade, in April, 1929. It is believed that this is the largest Coast Artillery unit ever assembled under one roof, and was an impressive sight.

The Brigade assembled at 8:55 P.M. with the 212th Coast Artillery (AA), Colonel William Ottmann commanding, the 245th Coast Artillery (HD), Colonel Bryer H. Pendry commanding, and the 244th Coast Artillery (TD), Colonel Lewis M. Thiery commanding, in line. General Gulick's staff consisted of Generals Lucius R. Holbrook, William E. Cole, Charles Elliott Warren, Sydney Grant, W. Irving Taylor, Howard S. Borden, John F. Daniell, Colonels Frank K. Ferguson, John R. Kelly, Frederick P. Stopford, Francis R. Stoddard, George W. Burleigh, Franklin Q. Brown,

Robert Starr Allyn, and Lieutenant Colonels Allen Kimberly and Chandler Smith.

Promptly at 9:00 P.M. assembly was sounded, and the Brigade was formed in line of masses, and was then closely inspected by the Reviewing Officer, each band playing during the inspection of its own regiment. Before passing in review, the decoration of the Purple Heart was presented to the following officers and men: Brigadier General Sydney Grant, formerly commanding officer of the 13th Regiment, (245th C.A. NYNG), Major Malcolm W. Force, Captain Henry G. Fowler, Lt. Thomas F. Hanney, and Sergeant Eugene E. Donohue of the 244th Coast Artillery, Lt. Andrew J. Pancoe, of the 245th Coast Artillery, and Private Benjamin Stein of the 212th Coast Artillery. (With the exception of General Grant, all of these men are still in active service.) The officers and men decorated then joined the reviewing party and the Brigade marched past in review.

This ceremony was followed by evening parade by the 245th Coast Artillery, Lt. Col. Robert P. Orr, commanding. During the evening the Brigade relay race was run, being won by the 245th Coast Artillery, with the 212th Coast Artillery second and the 244th Coast Artillery, third. Handsome prizes were awarded to the members of each team.

The officers of the Brigade then proceeded to the Board of Officers Room where an informal meeting of the Metropolitan Branch of the United States Coast Artillery Association, of which General Byrne is President, was held. General Gulick, who is National President of the Association, addressed the officers on current Coast Artillery subjects, activities and the latest developments of materiel. While the meeting was in progress, general dancing for the enlisted men took place on the main floor, and for the officers in the Officers Club Room. The regimental bands alternated in playing on the drill floor.

The review was preceded by a tea for General and Mrs. Gulick, given by Lt. Col. and Mrs. Allen Kimberly. Senior Coast Artillery Instructor, at their home, 25 Central Park West. Mrs. John J. Byrne entertained at dinner at Sherry's in honor of Mrs. John W. Gulick and the ladies of the reviewing party. General Byrne also entertained with a stag dinner at the Army and Navy Club in honor of General Gulick and the members of both General Gulick's and General Byrne's staffs. Immediately after the ceremonies at the Armory, General and Mrs. Gulick and a few friends were the guests of General Byrne at supper, at his home, 300 Park Avenue.

198th Coast Artillery (AA)(Del. N.G.)

THE training year 1931-32 has been the most successful ever carried out by this Regiment, and it is felt that it may be interesting to other organizations to set forth some of the important points in bringing about this result.

At the start of the training year it was decided that the artillery work would receive the greatest amount

of time which could be devoted to it without sacrificing other necessary training. Each gun battery was to train two complete gun crews and a complete range section. It was immediately apparent that this could only be done if the rate of attendance was maintained at a very high figure.

Efforts to secure high attendance were so successful that what had appeared a hopeless dream became a startling reality;—the attendance record at the Annual Armory inspection was one hundred percent.

The artillery training progressed very satisfactorily: constant stress being laid on accuracy of drill and the elimination of waste motion. The objective to secure a high rate of accurately directed fire and each man was thoroughly and carefully instructed in his duties.

In the meantime gunners' instruction and instruction in general subjects were being carried on with the same care and thoroughness. Progress charts were used as a check on this phase and they were conspicuously displayed as an incentive to men to improve their qualifications.

Schools for officers and noncommissioned officers were formed and classes held each week. The instruction for the next Armory period was discussed in addition to instruction in general and technical subjects.

The Combat Train was given special instruction in communications and ammunition supply. Headquarters Battery organized and trained a complete spotting detail, a communications section, a radio detail, and a panel detail in addition to training necessary headquarters personnel. Service Battery was trained in the handling, care and distribution of supplies.

Guided by carefully prepared programs and schedules the work was progressive in nature and all training was carefully supervised and coordinated.

An outstanding feature in the training of the Regiment is that the movement of the entire Regiment to camp is made by means of its own motor transportation. The problem of motor vehicle operators does not arise as each unit has a large number of men who are licensed operators. Additional training is given outside the regular armory period. Strict convoy regulation is maintained and the march is both creditable and instructive. In addition to the training value of this convoy, there results from it a saving in cost of transportation of about 1200 to 1500 dollars.

The march to camp was made on Saturday July 30. Establishment of camp was carried out smoothly and promptly. Filled with enthusiasm the batteries turned out Sunday morning, emplaced their guns and consolidated the gun positions. Telephone lines were laid and tested, observation stations were occupied and all details were instructed in their duties.

The results of the careful Armory training were immediately manifest in the smoothness and lack of confusion incident to this work. Each member of the various details seemed to know his duties and showed eagerness in carrying them out.

Monday morning everything was in readiness to start intensive training and again the results of the Armory period were noticeable in the speed with which details were organized and set to work. Settling and

calibration shots were fired that day after a period of tracking a towed target.

Advantage was taken of all flying time and full use was made of the ammunition for conducting preliminary practices at towed targets. Safety precautions were stressed and rigidly observed, at the same time bending every effort to speed up the rate of fire and the accuracy of drill.

Due to some delay on account of inclement weather, all record practices were fired on August 9. Each battery fired two guns and furnished a complete range section, using its own personnel exclusively. The rate of fire and the general conduct of the practices was very gratifying. Analyses have not been completed as this is written, but a preliminary inspection of the records indicates that the results were highly creditable.

The machine gun batteries were not neglected during this time, but less stress has been placed on their work since it is generally simpler in character. Fire control by means of tracers was the only method used. Gunners were given opportunities to fire on individual targets and those showing the highest percentage of hits were selected for record firing.

The functioning of machine guns and ammunition was not at all satisfactory. Guns are old and have been used to such an extent that wear in the receivers makes satisfactory adjustment impossible. Efforts to have three guns reconditioned or replaced are now under way.

One feature of the machine gun practices was notable and this was the organization of a competent and well trained range section for obtaining data for analysis. The functioning of this section was excellent, although the instruments used are poorly adapted to this work.

Recreation and athletics were not neglected, and the splendid programs provided were a decided factor in maintaining a strikingly high state of morale.

On the whole the training year climaxed by an outstanding successful camp, must be regarded as the finest and most productive in the entire history of the Regiment, and too much credit cannot be given the Regular Army Instructors, Major James C. Hutson, C.A.C. (DOL) and Captain Lewis A. Hudgins, C.A.C. (DOL), who were willing and ready to co-operate at all times.

Coast Artillery Reserves, 2d Corps Area

Colonel F. H. Stopford, CAC (DOL) Executive

Metropolitan District

THE new school year opened with by far the greatest promise of success that has ever attended this work. The usual monthly troop school meetings will be held at the Engineering Societies Building on the third Monday of each month and, in addition, school will be held each Monday night at the Army Building with the particular object of aiding officers to complete subjects essential to promotion. All work has been

thoroughly organized and complete arrangements made for competent instruction.

The instructors for monthly meetings are:

2nd Lt. Daniel H. Schmidt, 607th CA Subcourse 10-8
2nd Lt. Edward N. Wallen, 602nd CA Subcourse 20-3
2nd Lt. James E. McInenly 539th CA Subcourse 20-3
1st Lt. Godfred Von Hofe, 908th CA Subcourse 20-8
2nd Lt. Roy C. Haeusler, 539th CA Subcourse 20-8
Capt. T. K. A. Hendrick, 619th CA Subcourse 30-8
Capt. Robert W. Speir, 620th CA Subcourse 30-8
Major Herbert Ridgeway, 533rd CA Subcourse 30-9
Capt. Andrew Baird, 533rd CA Subcourse 30-9
Capt. John R. Melish, 602nd CA Subcourse 40-3
Capt. Vincent A. Lane, 607th CA Subcourse 40-3
Major Geo. L. Clarke, 607th CA Subcourse 40-4
Major Will I. Levy, 530th CA Subcourse 40-4

The responsibility for instruction at weekly meetings will be taken over for one month at a time by the following regiments:

October and November 1932...602d C.A., Colonel Azel Ames, Commanding.

December, 1932....607th C.A. Colonel Robert S. Allyn commanding.

January, 1933...619th C.A., Lt. Col. G. W. Johnston, Commanding.

February 1933....620th C.A., Lt. Col. H. R. Johns, Commanding.

March 1933....502nd C. A., Lt. Col. C. H. E. Scheer, Commanding.

April 1933.....530th C.A., Lt. Col. J. W. Barker, Commanding.

May 1933.....533rd C. A., Col. F. R. Stoddard, Commanding.

Next year the remaining regiments will complete the cycle.

The regiment conducting the school during any one month will furnish all the necessary instructors for the four classes under instruction and in so far as practicable correct all lessons submitted. The advantages of this system of instruction are that it will give each regiment and staff a chance to function as a unit, that it will train a large number of instructors during the year, and that it will put some of the responsibility of reserve training in the reserve units themselves.

The first meeting of the weekly Extension School Meetings was held at the Army Building, 39 Whitehall Street, New York, N. Y. on Monday, October 24, 1932, from 6:00 P. M. to 8:00 P. M. A satisfactory number attended. The instruction was given under the direction of Lt. Col. Charles Houston, 602d Coast Artillery. The following Reserve officers were instructors for the evening:

2nd Lt. Robert S. Gilmore, 602nd C. A.10-3
2nd Lt. Edmund G. Blackburn, 602nd C. A. ...20-2
1st Lt. Stephen A. Kallis, 602nd C. A.30-1
Capt. John M. Donnelly, 602nd C. A.40-1
Capt. Arthur H. Kasner, 502nd C. A.40-2

The spirit of every organization gives real hope that this will be a highly successful school year.

Upstate New York Coast Artillery Reserves

Major Joseph C. Haw, C.A.C. (DOL),

Unit Instr. for All Regiments

At this writing the 513th, whose members are sprinkled all over the landscape of New York State, is starting the extension school season with a bang. Colonel Young has taken hold of Reserve affairs in Ithaca and has projected meetings there every month. The campaign began with a talk by Senator Wadsworth.

In October the Unit Instructor hied himself to Rochester and Buffalo where the series of monthly meetings of the 522nd opened with fine attendance. The motion picture Training Film on the Antiaircraft Artillery Regiment was shown and met with a cordial reception. This was followed by pictures of the 522nd at Fort Tilden, in 1931 and 1932, taken by Lieutenants Skeele, 513th, and Kettler, 514th. It is hardly necessary to add that these brought a barrage of wise-cracks and were thoroughly enjoyed.

Early in October the Adjutant of the 514th, Lieutenant Horace S. Van Voast, Jr., was host to that Regiment at a Field Day and Steak Dinner near Schenectady. Nearly thirty turned out, and dart throwing, football, baseball, and wrestling provided plenty of fun and good appetites for the refreshments (the wrestling was entirely impromptu and the effect on clothes made the local tailors think the depression was over). Altogether, it was a glorious reunion.

The first fall meeting of the 514th, in Schenectady, was featured by a splendid talk on the Shanghai fighting of last February by a speaker who had been present at that affair. The motion pictures already mentioned were shown, and as members of the 514th as well as the 522nd figured in some of the scenes, they were thoroughly enjoyed. This meeting brought out an attendance of fifty-five, the largest on record in upstate New York for a Coast Artillery Reserve meeting.

621st Coast Artillery, Wilmington, Delaware

Major W. M. Cravens, C.A.C. (DOL) Unit Instr.

The regiment began its troop schools for the inactive training season of 1932-33 on October 4th, 1932. Regimental troop schools will cover the following sub-courses this year: 20-3 (Supply and Mess Management), 20-5 (Property Emergency Procurement and Funds), 20-6 (Defense against Chemical Warfare), 20-8 (Signal Communication for all Arms and Services), 30-1 (Mobilization), 30-2 (Orientation), 30-7 (Field Fortifications for Seacoast Artillery), 40-1 (The Harbor Defense Command), 40-7 (Training Management). On October 4th there was a total enrollment in troop schools of 52 students. In addition to these there are 43 students enrolled in Extension School work.

On October 15th, Colonel Tanner, the Regimental Commander, Major Cravens, C.A.C., Unit Instructor and a number of Reserve officers of the 621st Coast Artillery attended Organized Reserves Day at Fort DuPont, Delaware.

On October 25th the 621st Coast Artillery held its

annual Regimental Dinner at Casa Lambros on the Philadelphia Pike near the City of Wilmington.

Captain Ross D. Pillsbury, Commanding the 1st Battalion 621st Coast Artillery was elected President of the Reserve Officers Association, Department of Delaware on October 11th.

The regiment is looking forward to its active duty encampment at Fort Hancock, N. J. next summer. Although only 20 officers will be authorized to attend we already have 28 applications. This encampment will be preceded by an intensive special school program for those officers selected to go and for a few alternates.

Coast Artillery Association Trophy Presented to 955th C.A.(AA)

AT the banquet held in the Spalding Hotel in Duluth by the Duluth Chapter, Reserve Officers' Association, the U. S. Coast Artillery Association Trophy was presented to the 955th Coast Artillery (AA) by Major Willis Shippam, Senior Coast Artillery Instructor at the University of Minnesota, acting on behalf of the Association. Lt. Col. F. C. Tenney, Executive Officer of the 955th, received the trophy on behalf of the regiment. The 955th won the trophy for the year ending June 30, 1932, for excellence in Army Extension Course work, among a field of 103 Coast Artillery reserve regiments.

Congressman Melvin Maas of St. Paul himself a reserve officer in the Marine Corps, made the principal address of the evening on the subject, "The Present Situation in Washington in Reference to National Defense." During the course of his address Congressman Maas said:

"Preparedness is the backbone of peace. The fact that the United States has been a potential power the last 10 years has been the greatest factor in preserving peace. China has been the plaything of the world because it was unprepared to defend itself."

He also referred to pacifist activities at the University of Minnesota seeking the abolition of military training at that institution. He urged reserve officers to help spread the facts on national defense and write congressmen "as these highly organized pacifist organizations do."

Recently the Minnesota Department, Reserve Officers Association of the United States, of which Colonel F. C. Tenney is president, passed a resolution and presented it to the State legislature calling for the selection of four Regents of the University who will continue to maintain the required two years course in Military Science and Tactics.

Washington Chapter, U.S.C.A. Assn.

THE first annual meeting of the Washington Branch of the U. S. Coast Artillery Association was held at the Army-Navy Country Club on November 15th. The meeting was preceded by a dinner, attended by seventy

officers of the Coast Artillery, all components being well represented.

Officers elected for the current year were:

President: Captain John Caswell, Jr., CA-Res.

Vice-President: Major Walter W. Burns, D.C. N.G.

Secretary and Treasurer: Major Elmore B. Gray, C.A.C. (DOL). Lt. Col. Harry P. Newton, CA-Res., acted as Toastmaster.

Major General John W. Gulick, Chief of Coast Artillery, and President of the National Association, was the Guest of Honor, and principal speaker. Other speakers included:

Major General Henry D. Todd, U.S.A. Ret.

Major General Richmond P. Davis, U.S.A. Ret.

Brigadier General Andrew Moses, U.S.A.

Brigadier General Charles E. Kilbourne, U.S.A.

Brigadier General Joseph P. Tracy, U.S.A.

Colonel Wm. W. McCammon, Infantry (DOL).

Colonel Wm. F. Hase, C.A.C.

Colonel James B. Mitchell, U.S.A. Ret.

Colonel Frederick E. Johnston, U.S.A. Ret.

Each of the newly elected officers made a few remarks. Out-of-town guests included:

Brigadier General Joseph P. Tracy, Fort Monroe, Va.

Lt. Col. Earle W. Thomson, Annapolis, Md.

Lt. Col. James B. Bentley, Laurel, Md.

Major Robert M. Carswell, Richmond, Va.

Major Philip S. Schuyler, Richmond, Va.

Coast Artillery Reserve of Atlanta, Ga.

By Staff Sgt. S. F. Falcon, Jr.

WHEN General William T. Sherman made his historic march to the sea, he left in his wake a land of desolation, waste and destruction. His infantrymen, cavalrymen, and artillerymen played havoc with cities and towns along a route that took many days of hardship to travel.

The fight that took place in and around Atlanta is known as The Battle of Atlanta. That was the first battle of Atlanta.

The Second Battle of Atlanta was fought in the year of 1932. To be specific, beginning at 8:00 o'clock on the night of November 10th.

Instead of infantrymen equipped with muzzle-loading rifles, cavalrymen moving over broken terrain, and artillerymen laying a barrage with weapons that fired round steel balls, the forces defending Atlanta were armed with the latest antiaircraft weapons, sound detectors, searchlights, and range-finding instruments.

Instead of opposing a force that crept stealthily over hillside and down vale, fighters in the Second Battle of Atlanta had to repel an enemy that approached high above the clouds in a group of droning, speedy attack and bombing planes.

The "attack" took place at Candler Field and was one of the numerous demonstrations held in Atlanta in commemoration of Armistice Day.

The 69th Coast Artillery (Antiaircraft) with ten officers, 180 enlisted men, several three-inch antiaircraft and machine guns, as well as a group of searchlights, sound locators, and range-finding equipment,

motored to Atlanta from Fort McClellan, Alabama, its home station. Upon its arrival in Atlanta, some forty-odd Coast Artillery Reserve Officers, previously organized by the Commanding General of the Fourth Coast Artillery District into an outfit called the Provisional Antiaircraft Regiment, under command of Major Charles M. (Count) Boyer, took over and manned the 69th. The regular army officers supervised the demonstration.

The forces "attacking" the city consisted of two Army airplanes, one representing a "squadron" of attack and the other a "squadron" of bombers, moving from the North.

Word was flashed that the enemy was coming. The three-inch and machine guns were emplaced immediately. Sound detectors began to function and the powerful searchlights scanned the sky. In a moment the attack plane lay siege to the gunners, but it was met with a barrage of machine gun "fire." Several more "attacks" followed.

Then, long before the sound of motors of the "enemy" bomber could be heard by the spectators, the sound detectors located it. The data was transmitted to the searchlight crew, who immediately spotted the plane with the beams of the powerful searchlights. This then culminated into one of the most spectacular antiaircraft and aerial demonstrations ever held in the City of Atlanta. The three-inch guns began to bark, firing approximately 180 rounds of blank ammunition, while machine guns spurted some 2,000 rounds of blank 30-calibers. Flares, representing bombs, were released by the bomber. The battle continued for approximately two hours.

According to Atlanta newspapers, a crowd of over 30,000 persons, including some 600 or more reserve officers, viewed the demonstration. The affair, which was initiated and conducted almost entirely by Reserve Officers, was one of utmost value to the Reserve Corps, inasmuch as it proved that Reserve Officers can, if given the opportunity, the authority, and the materiel, organize themselves into and function as a formidable fighting unit.

Prior to the actual demonstration, Coast Artillery Reserve Officers of Atlanta were called upon to solve a problem in connection with the antiaircraft defense of Atlanta. It is interesting to note that a group of reserve officers, organized into a "board of strategy," worked up the problem. This board consisted of Major Charles M. (Count) Boyer, Major Ashley B. Haight, Captain Jesse H. Burke, and Captain William A. Knapp.

According to the general situation, war had been existing between a group of foreign powers (RED) and the United States (BLUE) since July 1, 1932. On October 15th several Eastern cities had been captured and the Great Lakes region occupied by foreign troops.

On November 9th, information was received that the enemy contemplated bombing and destroying the City of Atlanta on or about November 11th.

The special situation stated that on November 10th, at 10:00 A. M., the 69th Coast Artillery (AA) arrived at Fort McPherson, Georgia, and the Commanding

General, Fourth Corps Area advised the defending forces that additional antiaircraft regiments were available immediately upon request.

Each Coast Artillery Reserve Officer was required to study a map of the city and determine the number of regiments for proper defense of Atlanta. They were also called upon to show sectors to be defended by each regiment, to show location of batteries, both gun and machine gun and to state the sectors to be defended by machine gun batteries. Specific location of machine guns and the searchlight batteries were not required to be shown.

Solutions submitted by reserve officers required from three to twelve regiments for the proper defense of the city, but every one of them had the vital points of Atlanta and vicinity well covered. The solution called for four regiments, less several gun and machine gun batteries held in Reserve.

The 250th C.A. (Cal. N.G.)

By Capt. S. R. Dows, 250th C.A.

ARMISTICE DAY.—Fourteen years have passed since that memorable day which witnessed the close of active fighting in the World War. Armistice Day is now a long column of pageantry and parades commemorating a historical event and paying tribute to those who were not on the transport coming home.

This year the occasion brought an enormous gathering of service men to Oakland for the morning parade and to the University of California Stadium in the afternoon for a pageant and the West Coast Army-Navy Football Game. Two very prominent features in the parade were the Sixth Coast Artillery from Fort Scott and the 250th Coast Artillery (N.G.) of San Francisco. The battalion of the Sixth, lead by the Regiment's most excellent band, was commanded by Major R. Garrett. The performance of the band cannot be too highly spoken of. Compliments were showered on it from all azimuths. And the appearance of the organization was in keeping with the fine music.

The 250th Coast Artillery added a business-like touch by entering four tractor drawn 155s. With the band and three massed battalions the Guardsmen made a very creditable showing.

At the Stadium Pageant all troops were reviewed following which the 30th Infantry and the men from the Pacific Fleet exchanged honors. The massed colors of all units and service clubs made a remarkable showing in the clear afternoon sunlight and a drum and bugle corps of the massed field music completed the show. Admirals and Generals managed to arrive successively in order of rank which kept the saluting guns busy and tuned them up for the 21 gun salute which would have been for President Hoover had he been able to attend.

The football game—well it was played in a noble fashion with the yellow clad Army team fighting every

minute. The Navy was in the ascendancy however and could not be denied. Score—Navy 30, Army 0.

Coast Artillery Association Meets With Engineers

On November 30, the San Francisco Section of the Coast Artillery Association held a joint meeting with the American Society of Mechanical Engineers. The meeting was held at the San Francisco Armory of the 250th Coast Artillery.

Speakers at the meeting were Capt. I. Luke, Ordnance Corps, and Commander H. J. Abbett, U.S.N. The subject was "Recent Ordnance Developments" and was treated as a symposium. Both speakers had their talks so arranged as to bring out the comparison of Army and Navy ordnance activities. Since the audience was composed of naval, military and civilian components, the treatment of the subject was made quite general and was extremely interesting.

Following the dinner and program, the Armory was inspected and a demonstration of a mobile unit's range section with Cloke plotting board was conducted. Many of the engineers were familiar with plotting but the Cloke board required quite a bit of explanation.

By the time the inspection and demonstrations were completed the Third Battalion of the 250th C.A. was in the midst of ceremonies, Guard Mounting and Battalion Parade. Following this, the Regiment was reviewed with Officers of the A.S.M.E. taking the review with Colonel R. E. Mittelstaedt.

Colonel R. E. Mittelstaedt, 250th C.A. and Major W. M. Moody, Ord. Res. presided jointly at the meeting, Col. Mittelstaedt is Chairman of the Coast Artillery Association, while Major Moody is Chairman of the San Francisco Section, A.S.M.E. as well as executive officer of the IX C.A. Procurement Division of the Ordnance Reserve.

San Francisco Chapter, U.S.C.A. Assn.

THE regular Fall Meeting of the San Francisco Coast Artillery Association was held at the National Guard Armory at San Francisco on the evening of September 28th, 1932. Nearly one hundred Officers were present.

The election of Officers took place and after the Report of the Nominating Committee had been read, the slate was adopted as follows.

President	Colonel R. E. Mittelstaedt.(NG)
Vice-President	Major J. D. MacMullen, (RA)
Director	Colonel C. J. Mund, (OR)
Director	Lt. Colonel L. L. Pendketon.(RA)
Director	Major F. E. Emery, (RA)
Secretary-Treasurer	Major W. R. Miller, (NG)

The Board of Directors are holding a meeting the end of the month to plan events for the coming year.

Major General D. P. Barrows, NG, Commanding General of the 40th Division, was the Speaker of the evening.

The Big Review

By Private Charles C. Young, Fort DeRussy, T. H.

ONE of the most colorful reviews ever held by the Hawaiian Separate Coast Artillery Brigade took place on Tuesday afternoon, December 16, when the entire brigade honored the 15th Coast Artillery (HD), commanded by Colonel Homer B. Grant. This regiment won the United States Coast Artillery Association plaque for the fiscal year 1932 target practice season and the Hawaiian Department Commander's Cup, awarded for proficiency in sea-coast firing, gunner's instruction and preparations for practice, during the 1932 training year. The review was held on the parade ground at Fort Kamehameha.

A large civilian attendance turned out to witness

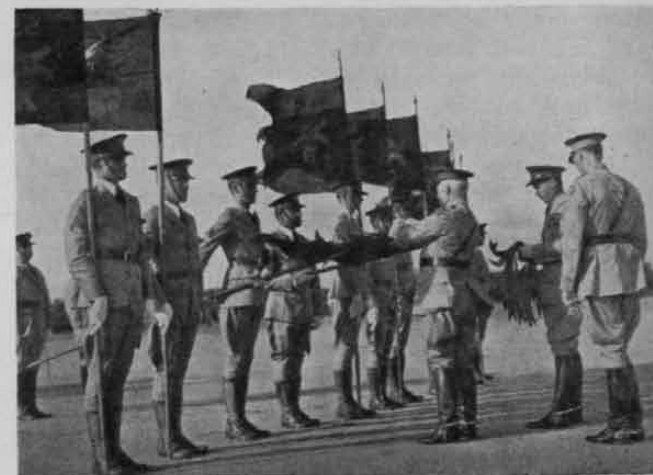


—Photo by Signal Corps U. S. Army.

The review stand—front row, left to right: Brigadier General Robert S. Abernethy, Hawaiian Separate Coast Artillery Brigade commander; Major General Briant H. Wells, Hawaiian Department commander; Colonel Homer B. Grant, commanding officer of the Harbor Defenses of Pearl Harbor and Major Berthold, who commanded the battalion of the 15th C.A. at the time they made the record. Staff row—left to right: Lt. Colonel W. V. Carter, Colonel Arthur L. Fuller, Second Lieutenant John R. Lovell, Major J. H. Hills, 1st Lieutenant Robert B. Hutchins. The table with the trophies is in the background.

of the brigade, while immediately to the rear were the eleven guidons of the Harbor Defenses of Pearl Harbor; to the rear of these came Colonel Grant and Major Berthold Vogel, who commanded the 15th Coast Artillery during the time the regiment made its record, while to the rear formed the colors of the 16th and 64th regiments.

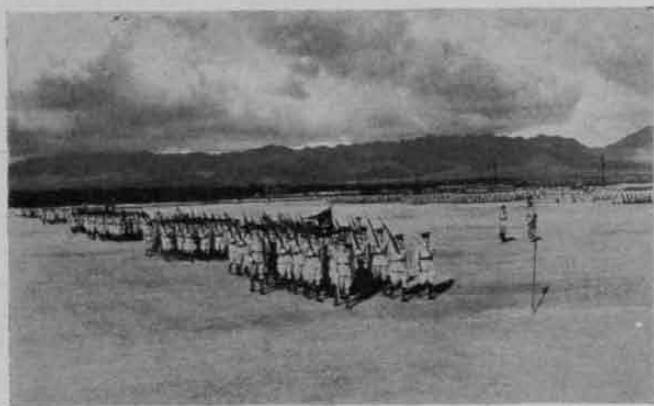
This distinguished group was marched up and reported to General Wells by the Brigade Commander, who then ordered the brigade to "present arms", while the National Anthem was played.



—Photo by Signal Corps U. S. Army.

General Wells tying the guidon streamers on the guidons of the winning units, accompanied by his aide, Lieutenant Hutchins and Major Hills, adjutant general.

General Wells presented the Coast Artillery Association plaque to Major Vogel, who received the coveted award on behalf of the 15th; the Department Commander's Cup to Colonel Grant, and then going down the line of guidons tied streamers marked "ARMS SUPREMACY" to each guidon of the winning units, which, with the Department Commander's



—Photo by Signal Corps U. S. Army.

A, B and C batteries of the 15th C.A. as they approached the right flag preparatory to passing in review. The reviewing stand is at the extreme right. The Koolau range with its ever-present bank of clouds makes a fitting background for the review.

the review, approximately five hundred cars being parked around the parade ground. Stands had been erected for the convenience of the spectators and they were filled to capacity.

Although a bright Hawaiian sun beat down on the immaculate sand-tan clad troops—resplendent with their white gloves and brightly shining bayonets—a stiff wind swept across the flat expanse of the reviewing field, from the direction of Barbers Point, that kept the battery guidons and colors whipping in the wind and lending color to the occasion.

For the presentation of the coveted awards, the brigade was formed in a line of close columns with the Harbor Defenses of Honolulu, commanded by Colonel Harry L. Steele and composed of the 16th Coast Artillery and the second battalion of the 55th Coast Artillery, formed on the right; in the center were the Harbor Defenses of Pearl Harbor, comprising the 15th, 41st and first battalion of the 55th, under command of Colonel Grant, while on the left was the 64th Coast Artillery (AA) from Fort Shafter with Colonel Richard H. Williams in command.

Brigadier General Robert S. Abernethy, brigade commander, took his place out in front of the reviewing stand. At General Abernethy's command, the colors and color guard of the 15th formed in front and center

Cup, remain the property of the 15th Coast Artillery for one year.

Colonel Grant and Major Vogel took their post on General Wells' left and the brigade passed in review under command of General Abernethy. The trophies were displayed on a table at the reviewing stand.

The Harbor Defenses of Honolulu, comprising troops from Forts Ruger and De Russey, were the first to pass in review, under the command of Colonel Steele. A fleet of trucks met the Honolulu troops as they reached the edge of the review field and whisked them away to their home posts, as the review was completed. Next came the Harbor Defenses of Pearl Harbor, followed by the 64th Coast Artillery, led by Colonel Williams. Each unit marched to the step of its own band.

General Abernethy turned out of line after passing the reviewing stand and joined General Wells, Colonel Grant and Major Vogel. All units were complimented on the fine appearance of their respective commands by the Department Commander.

In a special section, reserved for distinguished guests, was a group of army and navy officers and their wives. Rear Admiral Yates Stirling, Jr., commandant of the 14th Naval District, witnessed the review.

The 57th Coast Artillery (TD)

By Lieut. Joseph F. Cole, C.A. Reserve

DURING the early months of the World War there was organized at Fort Hancock, New Jersey, the parent unit from which the present 57th Coast Artillery was to be reconstituted in later years.

In reviewing the history of the original regiment, we find that the latter comprised enlisted personnel obtained from the Regular Army Coast Artillery stationed at Sandy Hook, New Jersey; from the New York National Guard, then in the Federal Service; and by the assignment of recruits. While in some cases nearly the entire personnel of the National Guard units was transferred, in no case, however, were the units themselves transferred. The commission personnel



thereof was assigned by the Adjutant General from officers from the Regular Army, the National Guard and the National Army.

With the regiment thus constituted, the organization served in France from May 25, 1918 to January 2, 1919, participating in the defense at Lorraine Sector, St. Mihiel and Meuse-Argonne Operations, returning thereafter to Camp Lewis, Washington, and demobilized in June, 1921.

Outstanding in the accomplishments of the regiment was the cutting of the railway between Montmedy and

Sedan from positions occupied near Stenay on November 6, 1918.

In order to perpetuate the history and traditions of the regiment, the latter was reconstituted on October 25, 1930, and placed in the Regular Army. The officer personnel in the new organization was transferred largely from the 608th Coast Artillery (TD) as previously organized at San Francisco, California, and forming part of the Organized Reserves.

The regiment at present is under the command of Major W. W. Breite, with Lieutenant Colonel R. H. Fenner, CAC (DOL) as unit instructor, and includes officers from California, Utah and Idaho. Camps are held at Fort Funston, the southernmost subpost of the Harbor Defense of San Francisco.

Particularly it was noted during the last encampment the organization of the regimental and battalion staffs, and the manner in which they functioned. The training schedule for artillery drill, service practice, field maneuvers and the like was effected through channels of a well coordinated organization, thus materially increasing the interest taken in the various activities.

Sub-caliber target practice was fired after two mornings of drill, with the officers assigned to various positions on the Manning Tables. Particular adverse weather conditions prevailed during the practice. However, as in the Biblical days of Moses, and with the aid of a so-called "flute" as carried by the adjutant, "the sun was called to the 57th Coast Artillery" in time for the service practice.

With the conditions thus favorable, the practice was undertaken on scheduled time, and three battalions fired their respective batteries of 155 mm guns without interference and with good results. The analysis of target practice was completed early during the second week, thus leaving the remainder of camp open for field problems.

In entering upon the field exercises, the several battalions were assigned sub-sectors in the vicinity of Half Moon Bay in which to establish their batteries for defense against an attack from sea. The orders for the movement were published, and the regiment thereupon departed for the purpose of conducting the necessary reconnaissance, selecting the gun positions as required for the accomplishments of the mission, and working out of the various details. The base lines were actually run and the details of a real practical problem worked out.

Knox Trophy Winner

THIS is the season for the announcement of trophy winners and the JOURNAL takes pleasure in announcing the winner of the Knox Trophy for the year ending 1932 as Battery C, 91st Coast Artillery (Philippine Scouts). Captain H. G. Hennessy commanded the battery. His article concerning the practice appears in another section of the JOURNAL.

The Knox Trophy is the oldest trophy awarded in

the Coast Artillery. It is furnished by the Society of the Sons of the Revolution in the Commonwealth of Massachusetts. The official award will be made at the annual dinner of the Society to be held in Boston early in 1933.

This award is made on the recommendation of the Chief of Coast Artillery to the regular army Coast Artillery battery having the highest score for the training year. It should be noted particularly that the personnel of this battery is furnished by the Philippine Scouts—a sufficient indication of the efficiency of our Philippine friends in handling a weapon which was unknown to them not so many years ago. The Chief of Coast Artillery has congratulated Captain Hennessey and his battery on their outstanding performance.

Some data touching the high lights of the practice are furnished to show the excellence of the practice.

The firing took place at Battery Geary (12-inch mortars) on January 19, 1932. (Only one practice was considered.)

Percent hits:	45 Broadside
	90 Bow-on
Time per round:	43 seconds
No. of shots:	20
Range:	7600
Score:	125

The deviations are so remarkable that they are given in detail—the mean error being only 7.9 yards (in range).

Shot No.	Deviation	Shot No.	Deviation
1	-47	11	+41
2	-73	12	+72
3	+9	13	-30
4	-18	14	+11
5	-5	15	+17
6	-17	16	-68
7	-30	17	-45
8	+13	18	-67
9	+34	19	H
10	-15	20	-157

The following is quoted from the indorsement of the Chief of Coast Artillery on the official report of the practice.

"This practice is outstanding. The smooth and excellent performance of both personnel and materiel indicate most careful preparation and training. The spotting section did particularly fine work in this practice. The method of handling the zone to zone correction utilized all of the information available and the results justified the procedure adopted. Other excellent features of this practice are:

(a) The freedom from avoidable materiel failures during record fire.

(b) The remarkable accuracy in direction. Out of the 20 record shots only two were off the bow-on target laterally, and these were close.

(c) The remarkable accuracy in range, only one record shot being off the bow-on target in range."

Errors in Firing Tables

ATTENTION is invited to Changes No. 1, July 1, 1931, to Firing Tables No. 12-G-1 for 12-inch mortar, Models of 1890, 1890M1, 1908, and 1912, firing 700-pound, 824-pound, and 1046-pound D. P. and C. I. shells with base increment charge.

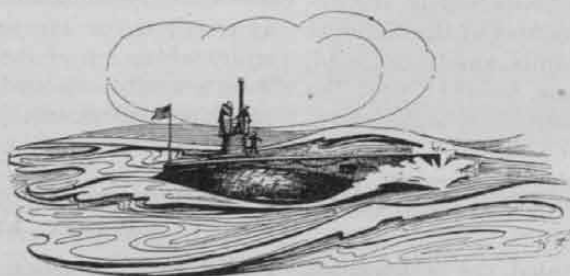
In printing the changes typographical errors were made for the weight of projectile for Zones VIII, VIII-B, IX and X. The corrections should be as follows:

a. On pages 170, 171, 172, and 173 (Zone VIII) weight should be 824 instead of 1046.

b. On pages 220, 221, 222, and 223 (Zone VIII-B) weight should be 700 instead of 1046.

c. On pages 246, 247, 248, and 249 (Zone IX) weight should be 700 instead of 1046.

d. On pages 274, 275, 276, and 277 (Zone X) weight should be 700 instead of 1046.



COAST ARTILLERY ORDERS

Colonel Louis R. Burgess, from the Philippines to recruiting, Salt Lake City.

Colonel John T. Geary, from the Philippines to Ft. Winfield Scott.

Colonel Charles H. Hilton, 9th C.A. Dist., Presidio of San Francisco, to 3d, Ft. MacArthur, January 1.

Colonel Harrison S. Kerrick, relieved Coordinator, Sixth Area, Kansas City, Mo., to Manila, sailing San Francisco, Feb. 10.

Colonel Howard S. Miller, retired, December 31.

Colonel Ralph M. Mitchell, from Panama to recruiting, Cincinnati.

Lt. Col. Hartman L. Butler, promoted Colonel, October 1.

Lt. Col. Frank Geere, from Hawaii to Coordinator, Sixth Area, Kansas City, Mo. Previous order to recruiting, Indianapolis, revoked.

Lt. Col. Albert Gilmor, 51st, Ft. Monroe, Nov. 15th, to Warsaw, Poland, as military attache.

Lt. Col. Howard K. Loughry, to the Philippines, sailing New York January 19 instead of January 12.

Major Karl F. Baldwin, promoted Lt. Col. October 1.

Major Joseph D. Brown, from Panama to 2d, Ft. Monroe.

Major Thomas C. Cook, promoted Lt. Col., November 25.

Major Joseph R. Cygon, Walter Reed General Hospital, retired.

Major Cyril A. W. Dawson, from commanding officer U. S. Army transport, St. Mihiel, to commanding officer U. S. Army transport, U. S. Grant, December 1.

Major Olin H. Longino, promoted Lt. Col., December 1.

Major Peter H. Ottosen, promoted Lt. Col., December 1.

Major Robert E. Philipps, 11th, Ft. H. G. Wright, to R.O.T.C., Owensboro High School, Kentucky.

Major Hugo E. Pitz (Q. M. C.), promoted Lt. Col., November 10, and from Mitchell Field to Ft. Totten as constructing quartermaster.

Major Edward C. Seeds, from Panama to R.O.T.C., Knoxville High Schools, Knoxville.

Major Jesse L. Sinclair, from Panama to instructor, Va. N. G., Lynchburg.

Major Carl J. Smith, from Hawaii to R.O.T.C., Reno High School, Nevada, instead of as previously ordered.

Major Edwin K. Smith, from instructor, Mass. National Guard, Boston, to R.O.T.C., Athens High School, Athens, Ga.

Major Edgar H. Thompson, promoted Lt. Col., December 1.

Major Edward W. Turner, 6th, Ft. Winfield Scott, to Org. Res., Altoona, Pa., sailing San Francisco, October 15.

Major Berthold Vogel, orders from Hawaii to 13th, Ft. Crockett, revoked.

Major Eugene B. Walker, promoted Lt. Col., September 1.

Major Charles K. Wing, promoted Lt. Col., October 1.

Captain Albert A. Allen, 13th, Ft. Barrancas, to Hawaii, sailing New York, March 1.

Captain Arnold D. Amoroso from Hawaii to 11th, Ft. H. G. Wright.

Captain Elvin L. Barr, from the Philippines to student, Quartermaster Corps School, Philadelphia.

Captain Thomas J. Betts, from office Chief of Staff, Washington, D. C., to Historical Section, Army War College, Washington, D. C.

Captain Kenneth C. Bonney, 13th, Ft. Barrancas, to Hawaii, sailing New York, December 13.

Captain Aaron Bradshaw, Jr., promoted Major, November 10.

Captain Nelson H. Duval, from 52d, Ft. Hancock, to Hawaii, sailing New York, December 13.

Captain Christian G. Foltz, promoted Major, November 1.

Captain Walter J. Gilbert, from Hawaii to 52d, Ft. Hancock.

Captain John L. Hayden, promoted Major, September 1.

Captain Harold S. Johnson, 6th, Ft. Winfield Scott, to R.O.T.C., Alameda High School, Calif.

Captain Ephraim P. Jolls, from Panama to 62d, Ft. Totten.

Captain Arthur L. Lavery, from Hawaii to instructor, Mass. National Guard, Boston.

Captain Leroy H. Lohmann, promoted Major, November 1.

Captain Paul W. Rutledge, from the Philippines to 2d, Ft. Monroe.

Captain William Sackville, promoted Major, November 1.

Captain Cyrus Q. Shelton, 6th, Ft. Winfield Scott, to the Philippines, sailing San Francisco, February 7.

Captain James H. Smith, from Hawaii to U. S. Disciplinary Barracks, Alcatraz, Calif.

Captain Charles H. Stewart, retired, November 30, on account of disability.

Captain Philip B. Taliaferro, to Panama, sailing New York, February 28, instead of as previously ordered.

Captain Arthur W. Waldron, orders to 8th, Ft. Preble, revoked.

Captain Fred B. Waters, from Hawaii to 2d, Ft. Monroe.

Captain John H. Wilson, office Chief of Coast Artillery, Washington, to Hawaii, sailing New York, March 1.

1st Lt. Edward Barber, from Panama to 52d, Fort Monroe.

1st Lt. Russell E. Bates, orders from Michigan State College to Hawaii, revoked.

1st Lt. James B. Carroll, Ft. Hancock, to Manila, sailing New York May 9, instead of as previously ordered.

1st Lt. Thomas G. Cranford, Jr., from language student, Tokyo, Japan, to 62d, Ft. Totten, sailing Chinwangtao, China, March 20.

1st Lt. Wilbur R. Ellis, 2d, Ft. Story, to Hawaii, sailing New York, May 9.

1st Lt. Girville L. Field, to Hawaii, sailing New York, Feb. 28th, instead of as previously ordered.

1st Lt. John L. Goff, 69th, Ft. McClellan, to Hawaii, sailing New York, Dec. 13th.

1st Lt. Francis J. Grueter, C.A.-Bes., New York, to active duty, Coast Artillery School, Ft. Monroe, September 18.

1st Lt. James L. Hogan, promoted Captain, November 1.

1st Lt. Frederick P. Keeler, 13th, Ft. Moultrie, to Hawaii, sailing New York, February 28.

1st Lt. Joseph C. Kilbourne, from the Philippines to 63d, Ft. MacArthur.

1st Lt. William S. Lawton, from 61st, Ft. Sheridan, to Panama, sailing New York, January 13.

1st Lt. Darwin D. Martin, to sail New York for Philippines January 19, instead of January 12.

1st Lt. William H. Papenfoth, 6th, Ft. Winfield Scott, to R.O.T.C., Oakland High Schools.

1st Lt. James F. Pichel, 9th, Ft. Banks, to R.O.T.C., Detroit High Schools, Michigan.

1st Lt. Lloyd Shepard, to sail New York for Philippines January 19, instead of January 12.

1st Lt. Joe F. Simmons, from Panama to 13th, Ft. Barrancas.

1st Lt. Rupert E. Starr, 14th, Ft. Worden, to R.O.T.C., San Francisco High School, Calif.

1st Lt. Everett C. Wallace, 61st, Ft. Sheridan, to Hawaii, sailing New York, February 28.

1st Lt. Arthur E. Watson, Jr., Letterman General Hospital, Presidio of San Francisco, retired.

1st Lt. John A. Weeks, from Hawaii to 9th, Ft. Banks.

1st Lt. Sherman E. Willard, promoted Captain, November 10.

1st Lt. Henry K. Williams, Jr., Letterman General Hospital, Presidio of San Francisco, to home and await retirement, sailing San Francisco, November 26.

1st Lt. Walter J. Wolfe, from Hawaii, to Coast Artillery Board, Ft. Monroe.

1st Lt. Henry K. Williams, Jr., Letterman General Hospital, San Francisco, retired.

2d Lt. Albert S. Baron, promoted 1st Lt., October 1.

2d Lt. Harry R. Boyd, from the Philippines to 11th, Ft. H. G. Wright.

2d Lt. Charles G. Calloway from Hawaii to 61st, Ft. Sheridan.

2d Lt. Edwin W. Chamberlain, 14th, Ft. Worden, to Hawaii, sailing San Francisco, December 2.

2d Lt. John B. F. Dice, from Hawaii to 52d, Ft. Monroe.

2d Lt. Carl H. Fernstrom, from Hawaii to 6th, Ft. Winfield Scott.

2d Lt. Alfred C. Gay, to sail New York for the Philippines January 19, instead of January 12.

2d Lt. Robert D. Glassburn, relieved

from Air Corps, Randolph Field to Panama sailing New York, December 22.

2d Lt. Robert F. Haggerty, from Hawaii to 11th, Ft. H. G. Wright.

2d Lt. Paul A. Jaccard, promoted 1st Lt. November 1.

2d Lt. George E. Keeler, Jr., from Panama to 2d, Ft. Monroe.

2d Lt. Adam A. Koscielniak, to the Philippines sailing New York, January 19.

2d Lt. Howard R. Martindell, relieved from Air Corps, Randolph Field to Hawaii sailing San Francisco, January 14.

2d Lt. Stephen M. Mellink, relieved from Air Corps, Randolph Field, to Hawaii, sailing San Francisco, January 14.

2d Lt. Roger W. Moore, 62d, Ft. Totten, to Hawaii, sailing New York, November 9.

2d Lt. John E. Mortimer, promoted 1st Lt. November 1.

2d Lt. Robert J. Moulton, promoted 1st Lt. October 1.

2d Lt. Paul B. Nelson, promoted 1st Lt. November 1.

2d Lt. Charles J. Odenweller, Jr., from Hawaii to 69th, Ft. McClellan.

2d Lt. Milton L. Ogden, to 62d, Ft. Totten, instead to Hawaii.

2d Lt. Paul D. Peery, 6th, Ft. Winfield Scott, to Hawaii, sailing San Francisco, March 25.

2d Lt. Cyrus L. Peterson, from the Philippines to 69th, Ft. McClellan.

2d Lt. Joseph H. Twyman, Jr., from the Philippines to 69th, Ft. McClellan.

2d Lt. Charles E. Wheatley, Jr., 51st, Ft. Monroe, orders to Hawaii, revoked.

2d Lt. Robert L. Williams, Jr., from detail in Air Corps, Randolph Field, Texas, to 13th, Ft. Barrancas.

2d Lt. Layton Z. Zimmer, promoted to 1st Lt. October 19.

Warrant Officer William F. Pascoe, A.M.P.S., to sail New York, January 19 for the Philippines instead of May 9.

Master Sgt. Stephen J. Moore, 52d, Ft. Hancock, retired, October 31.

Master Sgt. Dallas M. Sprinkel, 2d, Ft. Monroe, retired, September 30.

Master Sgt. Carl M. Taute, Coast Artillery School, Ft. Monroe, retired, November 30.

Master Sgt. Ignatius Viragh, 15th, Ft. Kamehameha, retired October 31.

1st Sgt. Joseph C. Bell, 6th, Ft. Winfield Scott, retired, November 30.

1st Sgt. John F. Christopher, 59th, Fort Mills, retired, December 31.

1st Sgt. George H. Devine, 55th, Ft. Ruger, retired, October 31.

1st Sgt. Lacey E. Halev, 9th, Ft. Banks, retired, September 30.

1st Sgt. Mallie Haynes, 51st, Ft. Monroe, retired, October 31.

1st Sgt. Adolph G. Jabas, 6th, Ft. Baker, retired, November 30.

1st Sgt. Julius Jacobs, 59th, Ft. Mills, retired, October 31.

1st Sgt. John H. Kincaid, 7th, Ft. DuPont, retired, September 30.

1st Sgt. Victor E. Lewis, 62d, retired, Fort Totten, November 30.

1st Sgt. James W. Meadow, 13th, retired, Fort Barrancas, November 30.

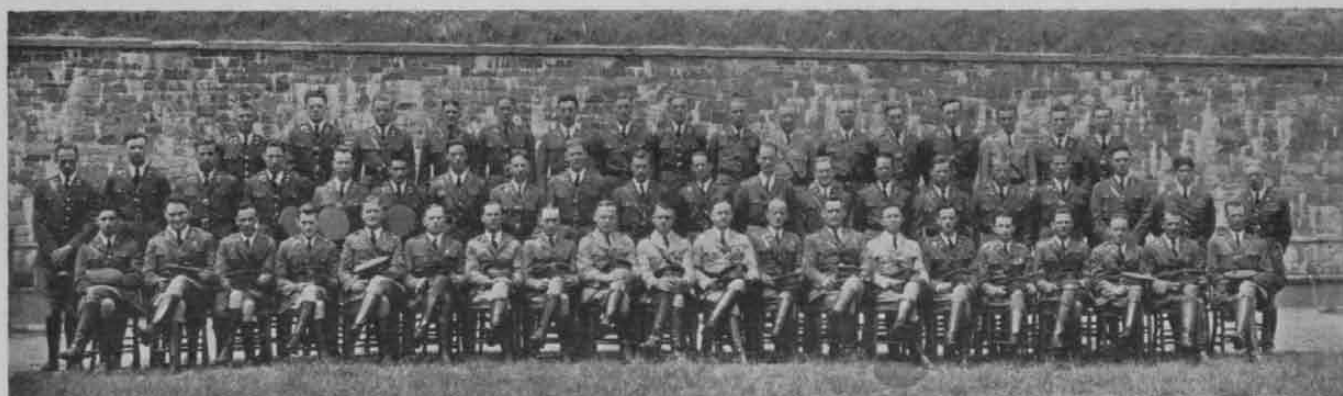
1st Sgt. David L. Merrell, 51st, Ft. Monroe, retired, December 31.

1st Sgt. Timothy J. Sullivan, 11th, Ft. H. G. Wright, retired, October 31.

1st Sgt. Ernst Sutter, 59th, Ft. Mills, retired, September 30.

1st Sgt. Harrison Williams, 61st, Ft. Sheridan, retired, December 31.

Sgt. Charles E. Britton, 62d, Ft. Totten, retired, September 30.



OFFICERS TRAINED AT FORT MONROE—516th COAST ARTILLERY, (AA) AND ATTACHED—JULY 24 TO AUGUST 6, 1932

Top Row, Left to Right: 2d Lt. M. Zofchak, 2d Lt. T. R. Graf, 2d Lt. W. J. Adams, 2d Lt. W. N. Shindel, 2d Lt. R. J. Campbell, 2d Lt. P. A. Bertoni, 2d Lt. W. J. Long, 2d Lt. H. Evans, 2d Lt. R. M. Morrell,* 1st Lt. S. McGee, 2d Lt. W. W. Quarles,* 2d Lt. W. R. Leek, 2d Lt. S. E. Welsh,* 2d Lt. H. N. Allen, 2d Lt. W. C. McCall, 2d Lt. A. Symons.

Middle Row, Left to Right: 2d Lt. J. E. Yoders, 2d Lt. D. E. Trieber, 2d Lt. H. P. Wills, 2d Lt. J. V. Heisch, 2d Lt. C. H. Downs, 2d Lt. W. R. Riggle, 2d Lt. A. M. Voysey, 1st Lt. C. R. Einfalt, 2d Lt. J. E. Conrad, 2d Lt. D. R. Falke, 2d Lt. E. F. Lafond, 1st Lt. C. R. Swenson, 2d Lt. W. Fleisher, 2d Lt. F. W. Beiter, 2d Lt. D. S. Cochran, 2d Lt. H. W. Blackburn, 2d Lt. T. A. Janssen, 2d Lt. D. W. Jennings, 2d Lt. R. H. Patterson, 2d Lt. J. C. Ladd.

Bottom Row, Left to Right: 2d Lt. R. M. Cohen, 2d Lt. J. M. Vessels,* 1st Lt. R. M. Price, 1st Lt. E. L. Schmidt, 1st Lt. F. C. Behrle, 1st Lt. E. F. Miller,* Captain J. W. Fisher,* Captain Kile C. Williams, Major Clayton R. Willis,* Major F. A. Hause, CAC (DOL) Unit Instructor, Lieut. Col. Jess B. Bennett,* Commanding, Major L. B. Herr,* Major George H. Collins,* Major Thomas McK. Evans, Captain H. F. Crawford, Captain A. B. Morris,* Captain L. J. Conkel, 1st Lt. R. K. Whitford, 1st Lt. P. J. Zimmerman, 1st Lt. W. B. Hardin.*

* Members of the 516th C. A., (AA)

BOOK REVIEWS

IT MIGHT HAVE BEEN LOST! by Thomas Clement Longergan, formerly Lt. Colonel, General Staff, A.E.F.

The chronicle from alien sources of General Pershing's fight to preserve the integrity of the A.E.F. Compiled from official documents of British and French record, it is an authentic account of the diplomatic and military negotiations undertaken by our Allies in the effort to have the American troops amalgamated in British and French divisions.

This phase of our participation in the World War, if touched on at all in military memoirs, has, either through lack of full knowledge of facts or tactful reticence, been treated as hardly more than a sidelight, a chapter or part of one, incidental to those of military operations. Probably the most momentous problem that confronted General Pershing, the complete story of his long and tenacious struggle to prevent the loss of the national identity of the A.E.F. is set forth in this volume.

Being intimately co-ordinated with the formation of the First Army, this struggle, in the telling, necessarily embraces the progressive stages of that great achievement. The checker-board moves of the American divisions and their activities expended intermittently along the entire front during June, July and August, 1918, with the culminating offensive of St. Mihiel, launched in the united echelons of an Army, are summarized accurately in the chronicle. In addition, therefore, to its historical value as a source material volume, it has a distinct appeal to the military student as a logistical treatise.

Lastly as collateral reference in the matter of historical research and arrangement of material, it has further professional worth in the personal library of the military student.

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SIMPLE AERODYNAMICS AND THE AIRPLANE, Colonel C. C. Carter, U. S. A. The Ronald Press, New York, 1932. \$4.50.

This book is a text for cadets at the U. S. Military Academy. It is an excellent and truly modern and thorough exposition of the forces acting upon an airplane, accompanied by a brief description of materials used in and methods of construction. The book also includes a discussion of various types of military airplanes, the equipment installed therein, and elementary principles of aerial navigation.

The exposition of the aerodynamic and inertia forces and the methods of securing stability and calculating performance is very thorough, being accompanied by such complete charts and tables of data that the student could establish the fundamental outline of the design of an airplane. No treatment of strength requirements and calculations or detailed design is attempted. A knowledge of elementary physics and mechanics is required for a proper understanding of the subjects presented. The book is an excellent text for

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use in engineering schools but is too technical for the average individual.

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"YORKTOWN, 1781," by Colonel H. L. Landers, Section. Army War College. 219 pages; 19 illustrations; 7 maps, 1931. U. S. Government Printing Office.

George Washington, resourceful and successful Commander in Chief of our ragged Continentals, is at his best in the remarkable series of land and sea operations that culminated in the surrender of Cornwallis at Yorktown. His masterful leadership in effecting the final concentration, involving the employment of French and American troops in harmonious cooperation with the French fleet under De Grasse, is ably presented in "Yorktown, 1781."

In preparing this book, the author has gone deeply into the most authoritative original sources, and has studied the ground with an appreciative eye for military values. His work displays not only professional military training, but a breadth of view which embraces the background of diplomatic maneuvers, in England and France, that had direct bearing on the outcome of the struggle then going on in America. Among the chapters devoted to the leaders on both sides those on Lafayette, D'Estaing, Rochambeau, Cornwallis, and Franklin at the Court of Louis XVI, are especially worthy of note. The story of the sea battle between the fleets of De Grasse and Graves, off the capes of Virginia, is one of absorbing interest. It is the most comprehensive account of this action that has appeared in print, and the only one that is adequately supplemented with a battle-map showing the positions and movements of the ships.

This book is published as Senate Document No. 273, 3d Session, 71st Congress, by the U. S. Government Printing Office. It is beautifully printed, well illustrated, and supplied with excellent maps. For the Yorktown area, the maps show both the fortifications of 1781 and the present road net, so that a person on the ground would have no difficulty in orienting himself. In addition, there are several oblique airplane views of Yorktown and its environs. A limited edition, cloth bound, is available for distribution by members of Congress, additional copies may be purchased from the Superintendent of Documents, Washington, D. C., cloth bound, at \$1.75 per copy. This book deserves a place on the shelves of every public and military library in the United States.

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AN ECONOMIC AND SOCIAL HISTORY OF THE UNITED STATES, by Edward Frank Humphrey, Ph.D., 639 pages. The Century Co., New York, 1931.

An intensely interesting account of America's growth and development since discoverers first set foot upon its shores. It traces the discoveries of the New World and follows the economic interchange and mutual reactions of the New World and the Old World systems. Every phase of the economic progress of the United States is treated in this penetrating study, which also reflects our political history and social evolution.